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# Circular Letter

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RESTRICTED SECURITY INFORMATION





To the Medical Service Personnel of the Far East Command and the United Nations Command in Korea:

AVE ATQUE VALE

October is the last month of my service in the Far East Command and the United Nations Command in Korea. In completing my active military duty and closing some thirty-six years of service in the United States Army, I am happy that my last post of duty has been here where history is being so strikingly made. Memory of the privilege of working with so many earnest, industrious, and efficient comrades is one that will never be erased from my memory. I do not really say farewell for I shall ever read of your continuing work with pride and with pleasure. May you have yet greater success in future, and surpass even the splendid record already made. Though the enemy has had many, we have escaped epidemics of those diseases against which prophylaxis exists - though this has never been true in any previous American war. This reflects hard work and professional skill of our preventive medical specialists. The death rate of United Nations patients admitted to our military hospitals is the lowest ever recorded in war. What professional ability and long selfless hours of work this indicates! On the field of combat our personnel, our medical commissioned and enlisted personnel, have risked their lives in saving those of their brothers-in-arms, and in so doing have won the Medal of Honor, the Distinguished Service Cross, the Silver Star, the Bronze Star, and the Purple Heart. The effectiveness of our scheme of collecting and evacuating the wounded has been accorded the praise of all our commanders of troops, including two Commanders-in-Chief, three Army Commanders, and the several Corps and Division Commanders. It is a gallant record, the memory whereof will be a proud and lasting souvenir of the conflict in Korea.

All these things have been made possible by the united efforts of thousands of patriotic medical men and women of the twenty-two United Nations now engaged together in the cause of freedom and justice in Korea, and by those who laboring through long hours in Japan, Okinawa, Guam, and the Philippines have so skillfully supported the military effort.

An able and experienced officer will succeed me, to whom I know you will give no less wholehearted support than you have given me.

To you I extend my best wishes and deep appreciation for the team work which has proven its effectiveness.

Hail and Farewell.

EDGAR ERSKINE HUME  
Major General  
Chief Surgeon, Far East Command  
Medical Director General of United  
Nations Forces in Korea  
Surgeon, Supreme Commander for the  
Allied Powers



THE SURGEON'S

Circular  
Letter

Volume VI - Number 10

OCTOBER 1951

General Headquarters  
Far East Command  
Medical Section  
APO 500

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## MAJOR GENERAL EDGAR ERSKINE HUME DEPARTS THE FAR EAST COMMAND

Friends and associates of Maj Gen Edgar Erskine Hume bade farewell to the Chief Surgeon of the Far East Command on 16 October, as he departed the command for the United States and retirement.

The Far East Command's top ranking medical officer since July 1949, General Hume will conclude his 35 year military career in December.

Born 26 December 1889, in Frankfort, Ky. he entered military service in 1916 when he was appointed a 1st Lieutenant in the Medical Reserve Corps. He was graduated the following year and was given a Regular Army date of rank of 14 January 1917. His earlier education included a BA degree from Centre College, Ky, in 1908 and a MA degree at the same school the following year; a Doctor of Medicine degree from Johns Hopkins University, 1913, and diplomas from the University of Munich in 1914 and the University of Rome in 1915.

General Hume won the first of his many military decorations during World War I when he served as Commanding Officer of a Composite Hospital Center of the Italian Army. He remained in Europe after the war as American Red Cross Commissioner to Serbia and surrounding territories and Director of the Anti-Typhus Fever Campaign in the Balkans until August 1920 when he returned to the United States.

His peacetime assignments included the Medical Field Service School at Carlisle Barracks where he served as Director of Administration and Winter General Hos-

pital in Topeka, Kansas, which he commanded.

In April 1943, General Hume was assigned to General Eisenhower's staff in North Africa for Military Government planning for the invasion of Sicily and Italy and as Allied Military Government Commander throughout most metropolitan areas of Italy and the U. S. Zone of Austria.

On 14 October 1951, General Hume was awarded a second Oak Leaf Cluster to the Distinguished Service Medal. The presentation was made by General Matthew B. Ridgway, Commander-in-Chief, United Nations Command, in a formal ceremony at the Dai Ichi Building, Tokyo.

The citation read in part: "As Surgeon, United Nations, Far East Command.....General Hume served with distinction in coordinating Korean civil relief, recovery, physical rehabilitation and amelioration of disease and unrest prevalent in the wake of war."

The citation pointed out that General Hume "always concerned for the combat soldier," steadfastly remained with forward elements during the stubbornly contested engagements in the Chosin Reservoir Area and the evacuation of Wonsan "to effect close medical support despite hazardous conditions posed by the adverse tactical situation and bitter winter weather."

Due in large part to the efforts of General Hume the citation added, the Korean conflict "has been singularly devoid of any epidemic disease, and the death ratio the lowest experienced in military history."

## UNEXPLODED 20-MM SHELL REMOVED IN DRAMATIC OPERATION

In an operation which could well serve as the climax of a war movie, a surgical team of the 8209th Mobile Army Surgical Hospital recently removed an unexploded armor-piercing shell from the shoulder of an American soldier while two 2d Division ammunition experts stood by to lend technical assistance.

The wounded man, Pvt Arthur C. Baree, was struck in the back by the 20-MM shell which penetrated the left shoulder and curved into the fleshy part of the outer arm.

Doctors said he was "in good shape" following the



hour-long operation and added that no permanent injury was likely to result.

The shell, which is designed to explode on contact, had apparently been well-spent when it struck the soldier. "Why it didn't explode inside him is one of those unanswerable miracles," one of the doctors said. Surgery was performed by Captain Erik Larsen and 1st Lt Joseph A. Amanti. Anesthetist was Major Jesse F. Brown, Commanding Officer of the 8209th MASH.

Called in from a division ordnance technical intelligence team to guard against explosion in the shell

removal were 1st Lt Richard A. Lyne and M/Sgt Reddick F. Simmons.

A spokesman for the Mobile Hospital who has followed the organization through hundreds of surgical operations from South Korea to the shadow of the Manchurian border during the unit's thirteen months on the peninsula, called the episode "our most drama-packed moment."

Pvt Barree, evacuated within hours after the operation, was disappointed. Someone had destroyed the 3-inch long, 1-inch thick souvenir he wanted to save.



#### ITALIAN HOSPITAL TO SERVE UN EFFORT

Italian and Red Cross flags were presented in ceremonies in Rome 13 October 1951 to the Italian Red Cross Hospital Unit which will depart soon for Korea. Among the attendants were David Owens, UN Assistant Secretary, a Red Cross Delegation headed by Hon Longhena and government officials and diplomatic corps representatives.

sist of 7 military physicians, 1 pharmacy officer, 1 chaplain, 2 administrative officers, 1 radiologist, 14 medical orderlies and 35 attendants. The hospital will be capable of handling 100 bed patients, and in addition will have 20 beds assigned for pediatric treatment. Two-hundred and fifty first aid patients can be cared for daily. The unit is equipped and staffed to give radiological, pediatric, dental, EENT and tubercular treatment on an out-patient basis. Special equipment for laboratory tests has been supplied to the hospital.

No exact date for the arrival of the Italian Red Cross Hospital in the Far East has been released.

Commanded by Captain Luigi Coia, the unit will con-

#### NOTABLES OF MEDICAL PROFESSION VISIT FEC



Within recent weeks a series of distinguished parties of especial interest to medical personnel have visited the Far East Command.

Dr. W. Randolph Lovelace, II, Chairman of the Armed Forces Medical Policy Council; Dr. Charles W. Mayo of the famed Mayo Clinic, and Dr. Leonard

Scheele, Surgeon General of the U.S. Public Health Service, made an extensive tour of Far East Command medical installations during September.

After a tour of medical installations in Japan, the party, joined by Major General Edgar Erskine Hume, Brig. Gen. James P. Cooney, and key members of Gen. Hume's staff, visited many hospitals, hospital ships and forward installations in Korea.

"We feel very proud of being members of the medical profession because of the results being accomplished here," Dr. Lovelace said, "the treatment and evacua-

tion of our casualties in Korea is a tremendous improvement over World War II.

"From General Ridgway on down to the line officers in combat, they are all intensely interested in medical problems and are profound in their praise of medical personnel in the Far East Command."

Drs. Lovelace and Mayo departed 3 October for the middle East, while Dr. Scheele is returning directly to the United States.

Just a few hours before their plane took off, Dr. Lovelace and Dr. Mayo stopped at the 406th Blood Bank in Tokyo and each gave a pint of blood, for, as Dr. Mayo said, "we saw at first hand how much blood is needed in Korea and it's little enough we Americans can give to save a life."

Late in September a party composed of the Surgeons General of the Thai Army, Navy and Air Force arrived to make a tour similar to one commenced a few days earlier by a group of Turkish medical officers. Headed by Brig. Gen. Necmi Sar, the Turkish officers inspected medical installations of all types in Japan and Korea.

#### RECENT DEPARTMENT OF THE ARMY AND FEC PUBLICATIONS

- AR 40-506, 24 Aug 51, C-4: Medical Service - Persons Eligible to Receive Medical Care at Army Medical Treatment Facilities
- AR 40-100, 27 Aug 51, C-1: Medical Service - Standards of Miscellaneous Physical Examinations
- AR 600-400, 28 Sep 51: Personnel - Casualties: Nonbattle Dead, Missing and Evacuated Sick and Injured who are Seriously Ill

- AR 35-1630, 2 Oct 51: Finance and Fiscal - Pay and Allowances of Contract Surgeons
- AR 40-230; AFR 160-161, 8 Oct 51: Medical Service - Prevention and Control of Communicable Diseases of Man - Immunization
- JLCOM CIR 42, 18 Oct 51: Sect III - Personnel - Hospitalized on Leave and Absentee Returnees, Disposition of





Cpl Jackson shoulders mine casualty on first leg of trip.

#### DOWN HILL 940

Private Cleave Andre, a victim of a mine explosion during the fight for Hill 940 in September, was promptly returned to medical care by hustling aid men of the 2d Infantry Division. The arduous trip down the mountain-side included one evacuation method more familiar to firemen than to medical technicians (see large photo).

Under existing battle conditions, the unorthodox carry was the most expeditious means, and Private Andre, happy to see the last of Hill 940, probably found little fault with his buddy's approach.

The injured man, well on his way to recovery, was returned to the United States for further treatment early in October.



At shelter. wounds are bandaged.



Litter bearers take over.



Jeep evacuates Andre to aid station.





## 60th INDIAN FIELD AMBULANCE UNIT MERITS WIDESPREAD PRAISE

There is perhaps only one medical unit in Korea today which has no rotation problem. That is the 60th Indian Field Ambulance Unit, now nearing its first anniversary of Korean service. Despite the recent assurance that no UN soldier would have to endure the second rigorous Korean winter, the Indian "paramedics" want

to stay and see the job through. So there is no rotation plan, either for individual soldiers or for the unit as a whole. They are furious at the thought of being pulled out of Korea.

The unit's morale, according to Brigadier P. L. Sen of the Indian Liaison Mission in Tokyo, is "terrifically high." They are doing the job assigned to them, and doing it well. They have their own records and a U. S. Army Commendation Ribbon to prove it.

In the ranks of the 60th are plainsmen from Mysore and Uttar Pradesh and natives of the Assam jungles, hillmen from Garhwal and Madhya Bharat and fiercely bearded Sikhs from the Punjab. The coastal areas of Bombay and Madras are represented, along with Bengal, Bihar, and Travancore.

And how does such a mixture of tribes--never used in an Indian infantry outfit--perform when the chips are down? With quiet emphasis Brigadier Sen pronounced the verdict of trial by combat.

"Their performance is splendid," he said. "Most of India is represented in the 60th Field Ambulance -- and it is a unit of which all India may justly be proud."

The United States Army also had something to say on the subject. In awarding the Meritorious Unit Commendation last July, Maj. Gen. Leven C. Allen, then Eighth Army chief of staff, stated:

"The 60th Indian Field Ambulance displayed such outstanding devotion and superior performance of exceptionally difficult tasks as to set it apart and above other units with similar missions. The individual and collective professional standards and conscientious achievements of members of this organization reflect the highest credit on themselves, their homeland, and the military service of the United Nations."

The Indians also have drawn praise from their Commonwealth brothers-at-arms.

Lt. Gen. Sir Horace Robertson, commander-in-chief of the British Commonwealth Forces in Korea, said, "The Unit has earned a fine reputation since its arrival in Korea and all ranks of the Commonwealth Forces have been delighted to hear of this very well deserved award."

British newsmen called the 60th the "smartest Unit" serving on the battle-ridden peninsula. One added the

creamiest of Commonwealth compliments--"They make the best cup of tea in Korea."

Religious preferences of the Indian medics are almost as diverse as their home states, with Hindus, Moslems, Christians, and the unshaven, unshorn Sikhs predominating.

Despite the wide divergence of faiths, dogmatic differences between the men pale before their common humanitarian purpose in war-torn Korea. Their job is to follow the tides of war and take care of its victims. They have been doing it now for nearly a year.

An integral part of one of India's two proud para-troop brigades, the 60th Field Ambulance shipped out of Calcutta on 8 November 1950.

The 330-man unit arrived in Pusan on 20 November and immediately started for the front by train, truck and ambulance. Its initial assignment was with the British 27th Infantry Brigade in the North Korean capital city of Pyongyang.

Heading the unit is Lt. Colonel A. G. Rangaraj of Vellore, Madras, graduate of Madras University medical school and veteran of World War II. Along with his second in command, Major N. B. Banerjee, from Barrackpore, West Bengal, Colonel Rangaraj made the Munsan jump with the American 187th Airborne Infantry Regiment last March.

The Indians had been at the front only a few days when the UN began its winter retreat. Colonel Rangaraj was advised to abandon his precious equipment and supplies in the doomed North Korean capital.

But the ingenious colonel had other ideas. Commandeering a train, he procured wood and water to operate it and steamed south with his entire unit--and equipment, intact.

When the Allies pulled up in Seoul for a stand just before Thanksgiving, the 60th remained as a unit with the Tommies.

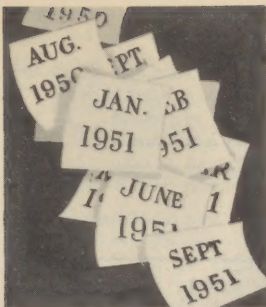
Seoul fell to the Communists shortly after New Year's Day. Colonel Rangaraj remained at the front while the 60th, under the command of Major Banerjee, was sent to Taegu to work with Commonwealth Headquarters troops.

Three of the unit's doctors began helping out in the local ROK army hospital. Soon their work had caused such a stir that officials of the United Nations Civil Assistance Command, Korea, asked Major Banerjee and his associates to lend a hand with civilian war casualties.

The 60th now operates in two sections. One team provides medical aid for British troops at the front while the other works with Korean military and civilian patients in Taegu. At intervals the two teams swap jobs. The men in Taegu move up and those on the front lines pull back for duty in the rear echelon.

They came to comfort the sick and heal the wounded... and they are doing it.





## UNITS CELEBRATE COMPLETION OF FIRST YEAR IN KOREA

Throughout September and October, many organizations marked the completion of one year of Korean service.

One of the first to celebrate this occasion was the Swedish Red Cross Hospital which arrived in Pusan for duty on 23 September 1950. A message of

congratulation from General Ridgway to Colonel Rolf Kaijser follows:

"Dear Colonel Kaijser:

On September 23, 1951, the Swedish Red Cross Hospital completes a year of outstanding service in support of the United Nations effort in Korea.

With the unprovoked Communist assault on South Korea, 24 June 1950, Sweden was quick to respond. Within a very short period of time, a two hundred bed hospital had been staffed and was on its way to join the United Nations team. Upon its arrival in Korea, the need for medical facilities was so acute that the patient capacity was increased immediately to four hundred and fifty. This change was undertaken and accomplished with the understanding, enthusiasm and energy characteristic of the Swedish people.

Obstacles have not been small. The necessary familiarization with strange new American equipment and administrative methods has constituted a tremendous handicap. There were language difficulties that came with the admission of casualties from the many other United Nations countries.

These obstacles have been overcome. At this time, over ten thousand patients have been treated in this splendid hospital. The combination of skill and consideration with which medical care has been rendered to these many patients is a credit to Sweden and to the United Nations.

On this, the first anniversary of the Swedish Red Cross Hospital's entry into Korean service, I offer my heartfelt thanks to all members of this organization and to the people of Sweden.

Sincerely,

M. B. RIDGWAY,  
General, United States Army"

The U.S. Navy's hospital ship USS REPOSE received high tribute from both Vice-Admiral C. Turner Joy and General James A. Van Fleet on the celebration of her first anniversary in Korean waters 22 September 1951. Admiral Joy's letter said in part:

"From the very beginning of hostilities in Korea, our hospital ships have provided the finest kind of medical care to the wounded of all the United Nations Armed Forces participating. The lives of countless fighting men have been saved in the past 15 months as a direct result of the skill and toil of the surgeons and facilities aboard these ships of mercy. In numerous cases, the most complicated and delicate operations are performed within a few hours after wounds have been incurred, accounting, in great measure, for the remarkable percentage of recoveries among the wounded in the Korean conflict.

"USS REPOSE has proven herself a sterling representative of these floating hospitals. In addition to her part in the United Nations ministrations to those fallen in battle, she bears the distinction of being the only major naval craft to have been in Korean waters constantly for one year.

"I am pleased to take the opportunity this occasion affords to extend my congratulations to all the personnel of the USS REPOSE for their splendid accomplishments of the past year. A most sincere and hearty 'Well Done.'"

A third organization whose service in Korea passed the first year's milestone was the 315th Air Division, whose units, under command of Brig. General John P. Henebry, have airlifted almost 300 thousand tons of supplies and equipment. General Van Fleet wrote General Henebry:

"It is a pleasure to join with all members of Eighth Army in extending congratulations and sincere appreciation to the officers and men of the 315th Air Division (Combat Cargo) on the commemoration of your first year's service in support of UN ground forces in Korea on 10 September 1951.

"..... Through their efforts, wounded have been assured speedy evacuation while the front line fighting men have been kept supplied with the wherewithal to repel and defeat the enemy. In addition, the work of the 315th Air Division personnel, in quickly and efficiently furnishing transportation for the Rest and Recuperation Program, have helped to maintain the high morale of UN troops."



## HOSPITAL TRAIN REMOVES UN WOUNDED FROM CLEARING STATION IN NORTH KOREA

An American Hospital Train entered North Korea on 12 October to evacuate UN wounded troops from an advanced clearing platoon, Colonel Thomas N. Page, Eighth Army Surgeon, announced.

This is the first time an American Hospital Train has crossed the 38th parallel since the withdrawal

of UN troops in December 1950.

Evacuation of wounded by hospital train from a clearing platoon is unusual, for normally division area evacuation is accomplished by helicopters and ambulances. Hospital trains are used to evacuate the wounded from medical installations in the supporting area after they have received medical and surgical care.

The precedent-breaking train was composed of American built hospital unit cars which provide every possible comfort for the casualties.



Fifty copies of the latest list of Army medical films and film-strips available for use by the Armed Forces for training have been received by GHQ Medical Section. In this edition of the Catalog, three methods of listing the films and film-strips have been used: by category index, numerical index and alphabetical

index.

Distribution to the Surgeons of the various commands within the Far East has been made and additional copies are being held for specific requests. It is recommended that such requests be addressed to the Chief Surgeon, GHQ, FEC, APO 500

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FROSTBITE\*

### GENERAL

Frostbite is a local cold injury that occurs following exposure to environmental temperatures of less than 25°F., and most commonly occurs at environmental temperatures below 0°F.

High altitude frostbite may occur in aviators

where the ambient temperature reaches -80°F. with the duration of exposure being a few minutes to a few hours. Hypoxia may increase the individual susceptibility to high altitude frostbite.

Ground-type frostbite occurs in ground troops, usually frontline combat soldiers when they become immobilized. The duration of exposure usually ranges from 3 to 48 hours, during which time the soldier may be pinned down by enemy action, motionless while riding in a vehicle, or sleeping with inadequate protection.

Contributory factors are insufficient and improper use of protective clothing, or wet feet, exhaustion, malnutrition, emotional tension and individual susceptibility. Frostbite has an appearance similar to trenchfoot, which occurs at ambient temperatures near or slightly above freezing following prolonged exposure of the feet to cold and moisture. It is usually associated with dependency and immobility of the lower extremities and with constriction of the limbs by shoes or clothing. Frostbite is not necessarily asso-

ciated with dependency of the lower extremities and constriction of the limbs by shoes or clothing. However, when these factors are added, an increase in severity of the injury can be expected. Severe weather conditions and immobility for at least several hours appear to be the most important factors in the production of ground-type frostbite.

### PHYSIOPATHOLOGY

Considerable controversy exists regarding the physiopathology of frostbite. The freezing temperature of human tissue is between 28°F. and 32°F., but actual solidification does not occur when the skin reaches this temperature because of the phenomenon of supercooling (the capacity of a tissue to go below its ordinary freezing point without solidifying.) Freezing of the skin usually occurs when the skin temperature is between 25°F. and 14°F. Tissues that are actually frozen are damaged as the direct result of a cold injury. However, the course of frostbite subsequent to rewarming indicates that a vascular component plays a significant role in the physiopathology.

During the chilling period a peripheral vasospasm exists. When the tissues are actually frozen, there is no movement of blood in the involved part. After rewarming, the vessels of the injured part are dilated and blood flows freely into the area as manifested by hyperemia. The part becomes edematous, and vesicles contain fluid which coagulates after a few days and is similar to plasma. Increased vascular permeability is present. This may continue for the first 10 days after rewarming as indicated by the fact that the vesicles will enlarge or refill if aspirated, and the edema may persist. Thrombosis may occur, resulting in an ischemic gangrene. Pathologic specimens of

\* From a conference on Cold Injuries, Ft Knox, Ky., held under the auspices of The Surgeon General, U.S. Army.



gangrenous tissue removed weeks, or even months after injury show adherent thrombi in all vessels. Thrombosis of the vessels probably does not begin until about 36 to 72 hours after rewarming. The ischemic and cold-injured tissues may dry and mummify or develop a wet, secondarily infected gangrene.

#### CLINICAL MANIFESTATIONS

The extremities are the most frequent site of frostbite. About 75% occurs in the hands alone. The most frequent sites of injury on the feet are the medio-distal portion of the great toes, the lateral aspect of the fifth toe, the heels, and the entire distal third of the foot. Except in the presence of wounds, where there is interference with the vascular supply the zone of injury rarely extends above the ankle. Common sites of injury of hands are the tips and the dorsal surfaces of the fingers.

Frostbite is clinically classified into 4 degrees of severity. This classification can seldom be made until 6 or 24 hours after rewarming, during which time all degrees of severity have a similar clinical appearance. All degrees of frostbite may be present in a single extremity with the most distal part being the most severely damaged.

First degree frostbite is characterized by numbness, erythema, swelling and superficial desquamation of the involved part. Desquamation usually takes place between the 7th and 14th day. Numbness of the toes alone does not constitute a first degree lesion. The occurrence of stinging or burning pain and swelling after rewarming is indicative of injury due to cold.

Second degree frostbite produces vesiculation of the skin. This degree of cold injury involves only partial thickness of the skin and does not extend into the subcutaneous tissue. The vesicle desquamates in 12 to 20 days, revealing a thin but intact skin. First degree frostbite will be present proximal to the second degree lesion.

Third degree frostbite involves the entire thickness of skin, extending into varying depths of subcutaneous tissue. Vesicles may or may not appear. If a vesicle does develop, its wall is much thicker than that seen in the second degree type. The vesicle sloughs in 25 to 45 days, revealing ulceration into the subcutaneous tissue. The extent of third degree lesions is variable. There may be a small area of full skin thickness damage at the center of a vesicle on a toe, or the skin and subcutaneous tissue of an entire digit may be injured with or without vesiculation. Second and first degree lesions surround the zone of third degree damage.

Fourth degree frostbite produces damage to all tissues and may even include bone, eventually resulting in loss of the part. Vesicles are not seen on the distal portion of the toes and parts that have incurred fourth degree damage. Thin-walled bullae are commonly present over the dorsum and sole of the foot at the proximal border of the severely injured part. The location of these bullae is of prognostic significance, usually indicating severe damage to those tissues distal to it.

Prehyperemic stage: The onset of freezing is not particularly painful. Uncomfortable coldness in the part is followed by numbness, which may be accompanied by a mild stinging or aching pain. While frozen, the part is without feeling "like a stump" or "like a block of wood." In cases of severe frostbite of the feet there is inability to walk. Cases of first, sec-

ond and third degree frostbite among ground troops rarely are seen by medical personnel before rewarming has taken place. Cases of fourth degree are sometimes seen while still in the frozen state. During this stage the socks may be frozen to the feet and there may be ice between the toes. Before rewarming, the involved part has a waxy white appearance and some tissue may be solidified.

Hyperemic stage: Following rewarming, the part becomes inflamed. In severe cases the injured part becomes grayish-blue or purplish-red. Swelling begins in less than 3 hours and vesicles or bullae appear in 6 to 24 hours. Parts involved in fourth degree frostbite will become cold 2 to 3 days after rewarming. These parts will remain cold and eventually will be lost. During the first 7 to 10 days the vesicles enlarge slightly and refill if aspirated. Edema disappears in 7 to 14 days. The hyperemic stage is considered to be terminated following the subsidence of edema. Numbness of the affected parts persists, but 3 to 10 days after injury paresthesias, aching and intermittent shooting pains are present. These symptoms are more marked if the patient has been ambulatory or if the ambient temperature is warm or very cool.

Posthyperemic stage: The clinical manifestations of this stage vary and depend upon the degree of involvement. Initially the injured extremity is anhidrotic and warm. The patient continues to complain of persistent hypesthesia intermittently coupled with paresthesias of the involved toes or fingers particularly when the injured part becomes over-heated or chilled. Between the 30th and 50th day after rewarming an increased rate of perspiration develops, particularly in the zone of second and third degree damage. At this time the patient will complain of inability to keep the involved part warm. In some cases a deep seated aching pain persists and may be associated with tenderness in the joints, usually the first metatarso-phalangeal joints or the arch of the foot. On dependency, the feet will develop a cyanotic appearance. Following desquamation, second degree lesions reveal an intact, poorly keratinized, thin, purplish-red sensitive skin that is easily traumatized. The third degree lesion, when the eschar is sloughed, has an ulceration extending into the subcutaneous tissue. Epithelialization in the borders of the ulcer proceeds at a rate of 2mm per week unless complicated by secondary infection or the presence of an excessive amount of loose necrotic tissue. The fourth degree lesion develops a line of demarcation between the 10th to 20th day, which gradually recedes distally until a true line of demarcation is reached somewhere between the 30th and 70th day. The line of demarcation will remain obscure or advance proximally if wet gangrene occurs.

#### TREATMENT

The principles in the treatment of frostbite are avoidance of trauma to the part which is mainly accomplished by bed-rest, the prevention of infection, and the promotion of healing which is partly dependent on the restoration and maintenance of adequate blood flow. Healing of lesions produced by frostbite is slow, requiring prolonged hospitalization. This necessitates a program of reconditioning and rehabilitation before the patient can be returned to duty or to civilian life.

#### Initial or emergency treatment:

(1) Constricting clothing, such as boots, gloves



and tight bands should be removed from the site of injury when the patient is first seen, whether the lesion is in the prehyperemic or hyperemic stage.

(2) Rewarming should be accomplished by exposure of the frostbitten part to room temperature 70°F. to 78°F. if the lesion is in the prehyperemic stage. Lesions that are in the hyperemic stage should not be exposed to temperatures above 78°F. Rewarming by holding the hands or feet near an open fire is to be discouraged since serious burns may result in an anesthetic frostbitten part. Brisk rubbing of the injured part, either during the prehyperemic or hyperemic stage, is to be avoided.

(3) General body warmth should be restored and maintained by removing wet clothing and wrapping in warm dry blankets. The restoration and maintenance of general body warmth will promote blood flow to the extremities.

(4) Patients with second, third and particularly fourth degree frostbite of the feet are to be made litter patients at the earliest practicable moment.

(5) Intact vesicles and bullae provide a safeguard against infection of underlying tissue. Vesicles and bullae are to be protected and should not be drained, aspirated or debrided. All medical personnel should be informed that blisters on the ends of the toes in cold weather are not necessarily due to friction or trauma. Blisters developing during cold weather should not be drained.

(6) To provide the best protection and maintain warmth the involved part should be covered by a dry, loose dressing through the period of initial evacuation. Pressure and petralatum dressings to the injured area are to be avoided. The petrolatum dressing generally results in maceration and secondary infection of frostbitten tissue.

#### Hospital Treatment:

The same principles applied in the initial treatment (that is, conservation of body heat, avoidance of trauma and infection) are continued in the hospital treatment.

(1) The duration of bed-rest depends upon the degree of severity of the frostbite. Strict bed-rest is necessary until such time as the vesicles and bullae have dried. This measure provides protection for the intact vesicles, which prevents the occurrence of secondary infection.

(2) Severe cases of frostbite of the lower extremities will have moderate marked edema. Elevation of the foot of the bed 5 inches will aid in the subsidence of edema and still not interfere with blood flow to the lower extremities.

(3) Maintenance of ward temperature between 70 and 78°F. is the most satisfactory. Higher or lower temperatures increase the degree of pain in the injured part. It is desirable to keep the frostbite lesion exposed to the air at all times. In those cases where frostbite involves the feet the sheets should be folded back 18 inches from the foot of the bed. By employing a fairly constant ward temperature together with air exposure of the injured part, pain does not become a serious problem and narcotics are seldom required.

(4) One pharmacological property of nicotine is the

production of peripheral vasoconstriction which results in a reduced blood flow to the extremities. The use of tobacco in any form should be prohibited in all cases of third and fourth degree frostbite, particularly fourth degree, since one of the principles of treatment is to maintain blood flow to the injured area thereby hastening tissue repair.

(5) A generally nutritious high protein high vitamin diet with additional ascorbic acid (250 mg. daily) should be supplied in order to aid in wound healing.

(6) Measures to prevent secondary infection should be instituted. At time of admission all patients should receive a tetanus toxoid booster injection. Patients having second, third and fourth degree frostbite with or without vesicles should receive a minimum of 300,000 units of penicillin daily.

(7) The frostbitten part should be washed or painted daily with a mild, colorless, non-irritating antiseptic solution (benzalkonium) (Zephiran chloride) 1:1000 to control the surface bacteria. In the presence of excessive amounts of necrotic tissue, cleaning is facilitated by the use of a saline solution containing a mild non-irritant antiseptic and hydrogen peroxide. The wound can be cleansed with this solution, or it may be soaked for 30 minutes.

(8) Vesicles and bullae should be left intact. They will frequently dry into a hard eschar. However, debridement of loose superficial necrotic tissue must be performed in the presence of frank or threatened suppuration. This must be performed frequently, particularly at the periphery of the lesion and including toe nails, where suppurative material most commonly collects. Such debridement will permit more rapid healing and prevent extension of superficial infection into deeper tissue.

(9) Physical therapy should be instituted at the bedside shortly after admission to the hospital. Passive manipulation should be avoided in the presence of bullae or threatened gangrene. Particular attention should be paid to the positioning of the feet, movement of the toes and fingers and other major joints. Patients are prone to develop an inversion of the foot and an anklyosis of the metatarsophalangeal joints. Once the ambulatory stage is reached the patient can be placed on a more active program of physical therapy.

(10) The enforcement of bed-rest for periods of 3 to 30 days is difficult and can be materially aided by providing a variety of entertainment for the patient at his bedside.

(11) Emergency amputations are seldom indicated in frostbite except in cases of severe fourth degree showing extensive putrefactive gangrene associated with lymphadenopathy and signs of general sepsis. Watchful waiting and time will allow a definite line of demarcation to appear, thereby preserving the greatest possible amount of tissue and retaining maximum function. An apparent line of demarcation may be seen early but debridement will reveal that the proximal zone of necrotic tissue is superficial with normal tissue below. One of the primary objectives in the treatment of fourth degree frostbite is to produce a dry mummified lesion with no signs of wet gangrene, making the patient transportable to the zone of interior for operative treatment.

(12) Therapeutic agents and procedures such as sym-



pathetic ganglion blocks, sympathectomy, vasodilators and anticoagulants have been used in the treatment of frostbite. The effect of any specific drug has not been adequately substantiated to warrant widespread or exclusive use. Special programs for evaluation have been set up in Army laboratories and in the Theater of Operations.

#### DISPOSITION:

Patients with first degree frostbite can be returned to full duty after 1 to 2 weeks of progressive recon-

ditioning.

Patients with second and third degree frostbite must not be returned to the combat zone while cold weather still exists because of a possible increased susceptibility to cold. A program of physical reconditioning for 2 to 3 weeks should be undertaken after healing has taken place and before reassignment to any type of duty.

Patients with fourth degree frostbite, as soon as transportable, should be returned to the zone of interior for definitive care and disposition.

#### COMMENTS ON EPILEPSY, GRAND MAL

Colonel Donald B. Peterson, MC, Neuropsychiatric Consultant, Medical Section, GHQ, FEC

#### INTRODUCTION

This writing is necessitated by the fact that among Army personnel there are hundreds of individuals who are subject to convulsive seizures of the grand mal type. This constitutes a problem, not easy of solution, since by the nature of the condition, such persons are alternately fit for full duty or completely incapacitated.

Although epilepsy is common, and has been recognized for centuries; since the etiology is unknown, and since the pattern of convulsions is unique to each individual, there is considerable confusion and misconception in the medical and lay press, and in the minds of many physicians. It would be presumptuous to believe that these comments will resolve all confusion, but a restatement of the problem of epilepsy only with particular regard to the Army, may be of service.

That separation from the Service is not the entire solution to the problem is evidenced by AR 40-115 which states in part "Paroxysmal Convulsive Disorders.....not controlled by medication are nonacceptable." The converse of this, of course, is that the controlled epileptic is acceptable and such person is enlisted and inducted into the Service. Further, for several years many known epileptics have been retained on general service under continuous standard anti-convulsive treatment, and where fraudulent entry into the Service occurred, a waiver of that fraud has been granted. This seems to be a matter not of general knowledge.

#### THE TYPES OF CONVULSIVE DISORDERS

For purposes of utilization of convulsive manpower, it is necessary to subdivide convulsive seizure disorders into functional groups so that evaluation of the patient with regard both to treatment and proper utilization may be made:

1. Organic Seizures
2. Syncopic Seizures
3. Psychogenic Seizures
4. Alcoholic Seizures
5. Epileptic Seizures

Organic seizures are an expression of organic brain disease or injury. Such patients together with syncopic patients constitute but a small proportion of seizure patients and do not enter into this discussion.

In almost all studies of large groups of convulsive

seizures in both Army and Navy, it is found that about one-half of the patients initially thought to be epileptic are, in the final analysis, psychogenic. The psychogenic seizure patient is of importance to this discussion only because he occurs in such large proportion, and is most difficult to differentiate from the epileptic.

The alcoholic seizure patient is important in that the character of the seizure is identical with that of epilepsy, but the treatment of the two is quite divergent.

We are here concerned with the grand mal epileptic convulsive patient, not with petit mal, nor with psychomotor seizure. That a patient with grand mal seizures may, with careful observation, prove to have some psychomotor component is strictly academic and immaterial. What is material is whether or not the condition can be well and easily controlled with available and non-toxic drugs.

Thus, the alcoholic, psychogenic and epileptic patients are those with whom we are most concerned on the basis of utilization. The differentiation of these conditions is not too easy. It is frequently said that if the physician could only see the seizure, the differentiation would be simple. This is not true because the psychogenic often simulate the other two which are identical to observation, and further, most physicians see so few convulsive seizures that they have little opportunity to become acute observers.

The alcoholic seizure is to be differentiated chiefly by history. These seizures occur only during the alcoholic hangover period. Careful history will reveal this. Any seizure occurring under other conditions is presumptively not alcoholic. Although not worked out statistically, in my experience, roughly 15% of true grand mal seizures are alcoholic. This condition is notable for the history mentioned, the almost invariably normal EEG, the fact that the seizures are not affected by dilantin and phenobarbital therapy and yield only to abstinence from alcohol. Parenthetically, it is believed that the inclusion of this condition into the diagnosis of idiopathic epilepsy is responsible for the belief, which to me seems erroneous, that alcohol is likely to precipitate a seizure in the epileptic patient. The diagnosis, ID, treatment and utilization or disposition of the alcoholic seizure patient are obvious from the above discussion.

The psychogenic seizure patient may be differentiated from the epileptic most easily and often, only be de-



termining whether or not there was true amnesia of an organic absoluteness for the period of the seizure. In the psychogenic, the memory gap may be filled in by persuasive inquiry, hypnosis, or barbiturate interview. The necessity for this differentiation is obvious, both from the treatment and the utilization points of view, because here again are two similar appearing conditions which do not yield to the same treatment and which, if misdiagnosed and improperly treated vitiate all efforts at proper evaluation and utilization. The EEG is a fine differential aid with only about a 10% error.

#### THE NATURE OF GRAND MAL EPILEPSY

Only a sketchy discussion beamed at the relationship of the epileptic to the Army is contemplated. It should serve to round out knowledge, raise questions and rectify certain misconceptions.

1. Epilepsy is widely distributed, occurring in one out of about 200 of the general population.

2. Grand mal epileptic seizures occur generally during periods of physical and emotional rest. They rarely occur when the individual is under pressure or active. Thus one battalion surgeon recently told me of three soldiers who presented convulsive seizures some days after running out of medication. Significantly, there were no convulsions until the unit came off the line into a rest area. This is standard, but is not a matter of general appreciation. Considering that one of each 200 persons one passes on the street and, very likely, the same ratio of automobile drivers, is epileptic, the fact that one seldom sees a convulsive seizure in people going about their daily business is significant of the fact that it is extremely rare for an epileptic, reasonably well controlled by medication, to have a convulsion during the time he is actively engaged in his daily duties. This fact cannot be stressed too much because there is a prevailing misconception to the contrary, which is responsible for much uninformed resistance to proper utilization of the epileptic.

3. Each epileptic on medication develops an individual, fairly rigid and predictable convulsive pattern. Thus, if the patient has had one seizure a year, it is not only fair, but reasonably accurate to prognosticate continuance of this pattern.

4. Once stabilized on medication, the administration of that medication must continue year in and year out. Altering the dosage timing, or drug may, of course, be done in order to achieve better control, but withdrawal of the drug will be followed by recurrence of seizures. A standard dosage of medication is 0.1 Gm Dilantin t.i.d. and 0.03 Gm Phenobarbital t.i.d. Variation from this schedule is often necessary and the dosage mentioned is to be regarded as a point of departure.

5. The Psychomotor epileptic individual of the epileptic fugue, clouded mental state type, in which gory crimes are committed, is rare. That individual is not to be confused with the grand mal epileptic who has a "psychomotor" component to his convulsion consisting, e.g. of lip smacking and masticatory movements. Similarly, mention of the word "psychomotor" in a report of EEG examination is not to be confused with a diagnosis of psychomotor epilepsy. The majority of EEG tracings in grand mal epilepsy

may be described as psychomotor in type, but this is descriptive of the tracing, not of the patient's clinical seizure manifestations.

6. Much has been written on the "epileptic personality", indicating that there are certain aggressive, undesirable traits. There may be some truth in such a concept in deteriorated, colonized epileptics, but in my experience with epileptics in the Army, quite the reverse is true. Very detailed, controlled clinical and psychological test evaluations have shown no such thing as a deviant personality in the Army epileptic. Of considerable importance is the fact that through ignorance the epileptic has experienced discrimination, and often reacts compensatorily, in a way, to prove he can do a job. Thus we frequently find controlled epileptics entering the Service fraudulently, conscientiously arranging for a continuous supply of their medication, and coming to our attention only when circumstance interferes with their source of supply. Further, two out of three give objective evidence of motivation for and desire to remain on duty. In psychogenic seizure this ratio is reversed. From this it is obvious that personality-wise, the epileptic has at least the minimum requirements to make a good soldier as found in the non-epileptic.

#### COMMENT

As stated above, although the nature of epilepsy does not change, yet our ideas regarding epilepsy are subject to much change. Many an unwarranted generalization has crept into the literature, due most likely to the confusing of alcoholic and psychogenic seizures with idiopathic grand mal epilepsy. It follows that our concepts regarding epilepsy need policing up; our diagnoses should be more accurate; and our dispositions should be more realistic from the utilization of manpower point of view.

The utilization of the epileptic requires that a clearcut evaluation be made so that only well controlled epileptics who are an overall asset to the Service are retained. Utilization also requires considerable reorientation of medical officers, no less than other officers of the using agency, so that on the one hand the unit surgeon accepts his responsibility to maintain the soldier on medication and on the other, classification, assignment, and commanding officers make proper assignment and use of the man, which for practical purposes premanently precludes only the driving of vehicles and working at dangerous heights.

Aside from the common sense fact that as far as possible all soldiers are to be used within the limits of their capabilities, there are other realistic factors to be considered. The Army does have quite a considerable pool of known and unknown epileptics; further known, controlled epileptics are being inducted into the Service legally since they are by regulation acceptable. Control of the seizures of the epileptic who fraudulently entered the service, and is dependent on a personal unofficial source of medication, is difficult to say the least, and inadequate. It follows that the intelligent handling and utilization of the epileptic requires some reorientation, accurate diagnosis and functional evaluation, and making the condition respectable. There surely is little point in losing a good soldier for the want of a little intelligent care and a moderate amount of dilantin and phenobarbital.



## WATER CHLORINATION

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### Historical Background

Chlorine was first used as a disinfectant for public water supplies in 1908 when bleaching powder or hypochlorite was used to treat the water supply for Jersey City, N. J. The success of this project plus the fact that the country was still in an era of major typhoid epidemics resulted in a rapid acceptance of this principle of water purification and a very rapid growth in its utilization. Epidemiologically, expectations were realized and drinking water was no longer the vehicle for transmission of wide-spread typhoid and other enteric disease epidemics. The bacteriologist could verify this by counting bacteria both before and after small amounts of chlorine were added to contaminated water and noting the reduction effected.

There have been three definite periods in the development of the science of water chlorination:

1. The first period followed chlorine's introduction in 1908. During this period it was generally thought that some constant fixed amount of chlorine could be used to sterilize any and all water. Research at that time was directed toward determining what that uniform dosage should be.
2. The second period was one in which it was recognized that waters varied in composition and required varying dosages of chlorine. It was then thought that it was the chlorine residual rather than the dosage that was important and all research was directed toward finding some standard residual that would guarantee a safe drinking water.
3. The present period is one in which it is still recognized that a residual is necessary but that, in addition, it is also necessary to know the form of the chlorine in the residual before it is possible to predict the efficiency of the purification process.

### Theory of Chlorination

The present concept of the chlorination of natural waters is that chlorine remains in the water as molecular chlorine for only a very short period of time and then changes its form by one or more of the paths outlined below:

1. Combination of chlorine with such inorganic reducing substances in the water as iron, manganese, nitrites and hydrogen sulphide.
2. Combination of chlorine with the organic matter present in the water.
3. Combination of chlorine with the ammonia and organic amines present in the water.
4. Combination of chlorine with the water to form various chlorine compounds.

An understanding of the action and interaction of the above reactions is essential to predicting the success of the chlorination process. Each of the above reactions will be discussed with relation to its effect on the bactericidal action of the chlorine that is added to water.

### THE COMBINATION OF CHLORINE WITH INORGANIC REDUCING SUBSTANCES:

There are certain inorganic reducing substances which, if present in water, combine with chlorine and thus decrease the amount of chlorine available to destroy bacteria. These reducing substances, which may or may not be present are: iron, manganese, nitrites, and hydrogen sulphide. The inorganic reactions occur much more rapidly than the organic reactions, and act in accordance with the laws of chemical composition.

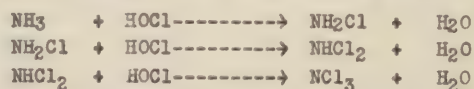
The chlorine going into these reactions is completely lost insofar as the bactericidal action of the solution is concerned. However, these reactions must be completed before reliable disinfection can be expected.

### THE COMBINATION OF CHLORINE WITH ORGANIC MATTER:

All natural surface waters and some ground waters contain organic matter. When chlorine is added to water containing organic material, the chlorine reacts with it and breaks it down into stable compounds. In any chlorination process there must be sufficient chlorine available to complete this reaction, because partially completed reactions produce highly undesirable tastes and odors, and because no free residual chlorine can remain in the water until this reaction has gone through to completion. The amount of chlorine necessary to complete this reaction is in direct proportion to the amount of organic material present in the water and only examination of the specific water under consideration will yield that information. An estimate can be obtained by carefully noting the color of the water; waters with greater amounts of color will usually require more chlorine to stabilize. This amount may vary from only a few parts per million to over a hundred parts per million in a highly organic water. The important point is that the chlorine consumed by these reactions is completely lost insofar as the primary objective of killing bacteria is concerned. However, this process is an essential preliminary to that final objective. The general rule is that sufficient chlorine must be added to water to stabilize the organic material and then have chlorine left over to meet the other demands.

### THE COMBINATION OF CHLORINE WITH AMMONIA:

Formation of Chloramines(1) - Ammonia and organic amines are frequently present in natural waters and react readily with hypochlorous acid to form monochloramine ( $\text{NH}_2\text{Cl}$ ), dichloramine ( $\text{NHCl}_2$ ), or nitrogen trichloride ( $\text{NCl}_3$ ). Probably this is a step reaction as represented by the following equations:



Bactericidal Action of Chloramines(2) - The disinfecting action of chlorine is modified by its change to chloramine, but is not necessarily lost. The chloramines still retain ability to destroy bacteria. The principal factors involved are:

- a. The pH of the Solution: The hydrogen-ion concentration has an important influence on the bacterial activity of the chloramine; with decrease in hydro-



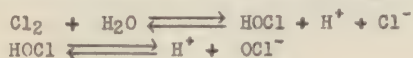
gen-ion concentration, there is a corresponding decrease in the bactericidal action of the solution. This is explained by Fair(1) on the basis of the relative amounts of dichloramine and monochloramine in the solution; the dichloramine (formed at lower pH values) being the most effective disinfectant and therefore the most desirable factor.

b. The Temperature of the Solution: The temperature of the chloramine solution also affects the bactericidal action. A general rule was found to be that a reduction of 20°C (from 20°C- 25°C to 2°C- 6°C) necessitated 9 times as long a contact period or 2.5 times as much chloramine to produce a 100% kill.

c. Concentration of Chloramines: Chloramines are much less efficient, bactericidally, than free chlorine. About 25 times as much chloramine as free chlorine being required under similar conditions, or the same amounts of each and a 100 times longer contact period for the chloramine. The compounding of a high pH water and low temperatures will produce very little bactericidal action from chloramines.

#### THE COMBINATION OF CHLORINE AND WATER TO FORM FREE AVAILABLE CHLORINE:

Formation of Compounds(1) - Free available chlorine is the name commonly applied to a group of three forms of chlorine, which may be found in water: molecular chlorine ( $\text{Cl}_2$ ), hypochlorous acid ( $\text{HOCl}$ ), and hypochlorite-ion ( $\text{OCl}^-$ ). An understanding of these three forms of chlorine is essential because only one, the hypochlorous acid is actually involved in the destruction of bacteria. The following equations show the development of the chlorine compounds:



The relative amounts of these compounds which will be formed are a function of the pH of the solution, and are given in the following table(3).

PERCENT OF FREE AVAILABLE CHLORINE AS:

pH	Molecular Chlorine	Hypochlorous Acid	Hypochlorite-ion
4.0	0.5	99.5	0.0
5.0	0	99.5	0.5
6.0	0	96.5	3.5
7.0	0	72.5	27.5
8.0	0	21.5	78.5
9.0	0	1.0	99.0
10.0	0	0.1	99.9

Bactericidal Action - The bactericidal efficiency of free available chlorine is determined by the following factors:

a. The pH of the solution. The pH value of the solution determines the relative amount of the chlorine which will be in the form of hypochlorous acid. It is now known(1) that hypochlorous acid is the important factor in the destruction of bacteria and that the greater the relative amount of it that is present, the more efficient will be the sterilizing action.

b. Contact time. The longer the contact time of the bacteria and the chlorine the greater the resultant kill.

c. Temperature. In pH ranges of 7 to 8.5 the bactericidal properties of free chlorine are not affected

by low temperatures(4). At higher pH values the activity does slow down with lowering temperatures.

Break-Point Chlorination - Break-point chlorination is merely a name given to the process which takes full advantage of the present knowledge about the mode and action of chlorine when it is introduced into natural waters. It means the addition of a sufficient quantity of chlorine to meet all the demands of the water (stabilize the organic material, oxidize the ammonia, and reduce certain inorganic substances) and still have a residual of free available chlorine remaining in the water after these demands have been met. The older processes controlled only the amount of the residual chlorine. Break-point chlorination controls both the amount of the residual and, what is much more important, the nature or form of the chlorine in that residual.

The advantages which can be expected from the break-point process and its free available chlorine are: (a) quick and reliable kill of bacteria; (b) reduction in tastes and odors resulting from organic materials present in the water; (c) bleaching of color in the water; (d) oxidation of ammonia and manganese and (e) prevention of biological growths in the filter plant and distribution system.

The only disadvantage is a slightly higher chlorine consumption and cost. The extra chlorine necessary to carry the reaction to the break-point and produce a free available chlorine may be only a few parts per million, or it may be considerable, depending on individual situations. Many waters will require a dosage of 7.8 or 9 ppm. to produce a free residual; others may require 15 or 20 ppm.; and in one case on record it required 110 ppm.

The break-point process should be utilized where it is necessary to have safe water quickly and where the water is subject to recontamination. The chloramine process may be utilized where there is a long contact period before the water is used, and where there is no possibility of recontamination.

The standard orthotolidine test can be used to give a close approximation of the relative amounts of free available chlorine and chloramines(5) that are present in water. Free available chlorine reacts almost instantly with orthotolidine at all temperatures. The reaction between orthotolidine and chloramines on the other hand is relatively slow, especially at temperatures less than 60°F. It then follows that the reading obtained immediately following the addition of orthotolidine will approximate the amount of free available chlorine present and the color developing thereafter will approximate the amount of chloramine present. Best results are obtained when the temperature of the solution is between 40° and 60°F, the first reading is made exactly 5 seconds and the second reading is made exactly 5 minutes after the addition of orthotolidine.

The 5 second reading will approximate the amount of free available chlorine residual present. The 5 minute reading will be a measure of the total residual present. The difference between the two readings will be representative of the amount of chloramine present.

The Action of Chlorine on Bacteria Cells - The manner in which chlorine acts on the bacterial cells to destroy them is now fairly well known(6). It is reasoned that since chlorine is effective at only trace levels, it must therefore inhibit some key enzymatic process within the cell. This was determined to be the oxidation of glucose by the cell and once this

(Continued on page 209)



# AN OUTLINE OF PUBLICATIONS

pertinent to

## Preventive Medicine

POLICY AND PRACTICE

Compiled by the Preventive Medicine Branch,  
Consultants Division, Med Sect, GHQ, FEC

Presented below is an outline of Department of the Army and FEC publications pertaining to preventive medicine policies and practice. This list has been prepared with the hope that it will be of assistance to medical officers and others in the Far East Command in their preventive medicine activities. The list includes the principle current references on the various subjects considered. In order that it may be kept current, it is recommended that reference be made to the section in succeeding issues of the SURGEON'S CIRCULAR LETTER listing recent DA and FEC publications.

### COMMUNICABLE AND INFECTIOUS DISEASE CONTROL

#### General:

AR 40-40, 9 Jul 51	Preventive Medicine Officer
AR 40-210, 25 Apr 45, and changes thereto	Prevention and Control of Communicable Diseases of Man
AR 615-250; AFR 160-51, 20 Sep 49	Enlisted Personnel, Physical Inspections

#### Immunizations:

AR 40-210, 25 Apr 45, Sec III and C-9, C-10	Prevention and Control of Communicable Diseases of Man
AR 40-215, 12 Aug 47	Immunization Register and Other Medical Data. Preparation and Disposition of WD AGO Form 117
DAAF Cir 117, AFL 160-17, 27 Apr 48	Parenteral Injections
DAAF Cir 153, AFL 160-150, 25 May 48	Stimulating Dose of Immunizing Agents
SR 40-210-10, 8 Feb 50	International Certificate of Inoculation and Vaccination
SR 40-225-21, AFR 160-54, BuMed Cir Ltr 50-14, 10 Mar 50	Yellow Fever Immunization Requirements, Pakistan
SR 140-120-1, 13 Apr 50	Immunization (CRC)

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FEC Cir 9, 27 Feb 50	Immunization
CINCFE Radio ZX 14960, 29 Aug 50	Immunization Requirements for Personnel Departing for Korea
DA Radio 40768, 20 Jan 51	Summary of Immunization Requirements for Overseas Movements
CINCFE Radio ZX 34930, 22 Jan 51	Summary of Immunization Requirements for Individuals and Units Preparing for Overseas Movement
CINCFE Radio ZX 40004, 20 Feb 51	Prevention of Smallpox
TB MED 114, 26 May 49	Immunization
The SURGEON'S CIRCULAR LETTER, 1 Jul 51	Immunization Requirements of the FEC
A Guide Issued by Air Surgeon, MATS, 15 Jan 51	A Guide to World Wide Immunization Requirements
Sound Film Strip 8-106	Smallpox Vaccination
<u>Respiratory Diseases:</u>	
SR 40-210-20, 6 Nov 51	Influenza Detection and Report
AR 415-107, 7 Jun 50	Space Allowances at Permanent Installations
TB MED 47, 28 May 44	Respiratory Infections
<u>Malaria:</u>	
AR 40-205, 27 Nov 50	Military Hygiene and Sanitation











TB MED 200, 6 Feb 46	<u>DDT</u> - Spraying of DDT from Aircraft	TB MED 224, 16 Aug 46	<u>NUTRITION</u> - Medical Nutrition Examination
TB MED 143, Feb 45, C-1, 4 Feb 47	<u>DIPHTHERIA</u> - Cutaneous Diphtheria	TB MED 68, 18 Jul 44	<u>PHILIPPINE ISLANDS</u> - Medical and Sanitary Data on Philippine Islands
TB MED 184, Jul 45	<u>DISINFESTATION</u> - Disinfestation Procedures	TB MED 124, Dec 44	<u>PLAGUE</u> - Plague
TB MED 119, Nov 44	<u>DYSENTERY</u> - Bacillary Dysentery	TB MED 193, 31 Aug 45	<u>POLIOMYELITIS</u> - Poliomyelitis
TB MED 181, 6 Apr 47	<u>ENCEPHALITIS</u> - Japanese B encephalitis	TB MED 141, Feb 45	<u>RATIONS</u> - Nutritional Value and Characteristics of Certain Expeditionary and Packaged Rations
TB MED 142, Feb 45	<u>FILARIASIS</u> - Filariasis (Wuchereria) with Special Reference to Early Stages	TB MED 47, 28 May 44	<u>RESPIRATORY INFECTIONS</u> - Control of Disease of Respiratory System and Other Diseases Transmitted by Discharge from Respiratory Tract
TB MED 186, Jul 45	<u>FUNGIPROOFING</u> - Moisture-proofing and Fungiproofing (Tropicalizing) Medical Department Equipment	TB MED 97, 29 Sep 44 and C-1, 14 Jan 47	<u>RHEUMATIC FEVER</u> - Rheumatic Fever
TB MED 57, 23 Jun 44	<u>GUAM</u> - Medical and Sanitary Data on Guam	TB MED 108, 24 Oct 44	<u>RYUKYUS ISLANDS</u> - Medical and Sanitary Data on the Ryukyus Islands
TB MED 175, Jun 45 and C-1, 25 Nov 46	<u>HEAT</u> - Prevention and Treatment of Adverse Effects of Heat	TB MED 82, 8 Aug 44	<u>SAND-FLY FEVER</u> - Sand-fly Fever (Pappataci, Phlebotomus)
TB MED 206, 3 Nov 45	<u>HEPATITIS</u> - Infectious Hepatitis	TB MED 167, Jun 45 and C-1, Jan 48	<u>SCHISTOSOMIASIS</u> - Schistosomiasis Japonica
TB MED 114, 28 Feb 47, C-1, 26 May 49	<u>IMMUNIZATION</u> - Immunization	TB MED 190, Aug 45	Water Treatment in Areas where Amebiasis and Schistosomiasis are Hazards
TB MED 121, Dec 44	<u>INSECTICIDE</u> - Impregnation of Clothing with Insect Repellent (Dimethyl Phthalate). Spraying of DDT from Aircraft, TB MED 200, Feb 46	TB MED 35, 27 Apr 44	<u>SOLVENTS</u> - Health Hazards from Industrial Solvents
TB MED 160, May 45	<u>JAPAN</u> - Medical and Sanitary Data on Japan	TB MED 163, May 45	<u>SWIMMING POOLS</u> - Sanitary Control of Army Swimming Pools and Swimming Areas
TB MED 208, 6 Dec 45	<u>KOREA</u> - Medical and Sanitary Data on Korea	TB MED 81, 4 Aug 44 and C-1, 3 Oct 44	<u>TRENCH FOOT</u> - French Foot
TB MED 135, Jan 45	<u>LABORATORY</u> - Function and Scope of Medical Department Laboratories	TB MED 231, 6 Jan 49	<u>TUBERCULOSIS</u> - Prevention of Spread of Tuberculosis in Army and Air Force Hospitals
TB MED 205, 1 Nov 45	<u>LEPROSY</u> - Leprosy	TB MED 31, 21 Jan 48	<u>TYPHUS</u> - Scrub Typhus Fever (Tsuksugamushi Disease)
TB MED 164, Jun 45	<u>MALARIA</u> - Malaria Control in the Army	TB MED 218, 17 Apr 46	- Epidemic (louse-borne) Typhus
TB MED 216, 13 Feb 46	<u>MANCHURIA</u> - Medical and Sanitary Data on Manchuria	TB MED 230, 6 Jan 48	<u>VENEREAL DISEASE</u> - Management of Venereal Disease
TB MED 209, 29 Nov 45	<u>MONGOLIAN</u> - Medical and Sanitary Data on Irkutsk and Chita Oblasts, and the Yakut and Buryat-Mongolian Autonomous Republics	TB MED 212, 16 Jan 45	<u>VIRUS</u> - Neurotropic Virus Diseases. (See Poliomyelitis, Infectious Hepatitis, and Japanese B Encephalitis)
TB MED 53, 12 Jun 44	<u>NUTRITION</u> - Emergency Feeding of Infants, Children and Other special groups of Civil Populations	TB MED 229, 18 Jan 49	<u>WATER</u> - Sanitary Control of Water Supplies for Fixed Installations
TB MED 141, Feb 45	<u>NUTRITION</u> - Nutritional Value and Characteristics of Certain Expeditionary and Packaged Rations	TB MED 190, Aug 45	Water Treatment in Areas where Amebiasis and Schistosomiasis are Hazards



(Continued from page 204)

power was lost the cell died. It is most likely that chlorine stops the action of Triosephosphoric Dehydrogenase, an enzyme which catalyzes an oxidation reaction essential to the utilization of glucose. Iodine seems to act on some other essential enzyme which may explain its greater cysticidal power.

When enzymes are removed from cells, they are equally susceptible to destruction by a number of other oxidizing agents -- hydrogen peroxide and potassium permanganate, which are known to be inferior disinfectants. This indicates that the cell walls are important factors in preventing entrance of these materials into the cells. Also, it has been found that the rate of action of these agents is in direct proportion to the rate of penetration of the materials through the cell walls.

It then follows that hypochlorous acid is a superior disinfectant because of its ability to penetrate cell walls quickly due to its small size and neutral electrical charge rather than just because of its strong oxidizing power.

Safe Residuals - It is believed that sufficient information is now available to enable one to predict with reasonable accuracy whether or not bacteria will be killed under a given set of conditions. At the large municipal water treatment plants in the United States this is routinely accomplished and with good results. The water usually comes from large, well-developed sources and varies only slightly in composition from season to season. The treatment processes are based on frequent laboratory analyses and are controlled by scientific instruments and skilled operators. Distribution of the water to the consumer is through a system of pipes which prevents recontamination.

The conditions being encountered in the Far East, and particularly by the field army in Korea, are different than in the United States. It is not practical to study, analyze and plan for the hour by hour treatment of each source of water. Therefore, blanket requirements are established which will guarantee a safe drinking water under expected conditions. The principal factors which are taken into consideration in establishing a chlorine residual for use by organization such as the Eighth Army using a wide variety of water sources are:

a. The pathogenic organisms likely to be encountered. The concentration of chlorine required to inactivate or kill varies from specie to specie. The virus of

infectious hepatitis is one of the most resistant encountered in this area.

b. The pH of the water and the amount of ammonia in the water. These two factors determine the final form of the chlorine compound and hence its bactericidal efficiency.

c. The temperature of the water. The action in cold water is much slower than in warm water. With cold water, either higher residuals or longer contact times are required to produce the desired result.

d. Contact time. It requires time for the chlorine to pass through the bacterial cell walls and kill the cell. With high concentrations of chlorine this is accomplished quickly; with low concentrations it requires a much longer contact time. In the Army the contact time is usually accepted as 30 minutes and the chlorine residual adjusted accordingly.

e. Probability of recontamination after treatment. Waters which are susceptible to recontamination should carry sufficient chlorine to kill bacteria right up to the time the water is consumed.

f. Factor of safety. After all other factors are evaluated, a factor of safety is added to compensate for incompleteness of scientific knowledge, unusual conditions, variations in equipment and supplies, and operator and other human errors.

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ACUTE NECROTIC ULCERATIVE GINGIVITIS (VINCENT'S INFECTION) - AN APPROACH TO RAPID AND COMPLETE THERAPY  
1st Lieutenant Charles F. Sumner III, DC, 40th Infantry Division, APO 6

Acute necrotic ulcerative gingivitis is a painful inflammation of the gingival tissue characterized by a type of pseudomembranous formation (made up of bacteria and necrotic tissue) and superficial ulceration.<sup>5</sup> Adding to this well established definition we might say it is particularly common in the age group which comprises the greater part of our Armed Forces. This disease results in more discomfort, loss of time and efficiency, than any other dental disease to plague this group.

Since its first description in 1894 by Plaut and Vincent this condition has been studied and widely writ-

ten upon by both the dental and medical professions. The official nomenclature has been changed from Vincent's infection (1923) to the more descriptive necrotic ulcerative gingivitis (1947) by the Committee on Nomenclature of the American Academy of Periodontology. For a brief period it was referred to as Trench Mouth, and thought to have epidemic possibilities.

#### RESEARCH AS TO ETIOLOGY:

In the years of clinical and laboratory research which followed the original work of Plaut and Vincent



several facts have been established.

Necrotic Ulcerative Gingivitis is not communicable. Rosebury<sup>4</sup>, after extensive work, concluded that the etiology and pathogenesis of Vincent's Infection suggest it is not communicable. Schwartzman and Grossman tried direct transmission to the gingivae and throat in 25 cases. That in all 25 cases direct transmission was unsuccessful certainly tends to disprove the communicability of the disease.

The onset and destructive characteristics of necrotic ulcerative gingivitis has long been attributed to the Vincent's organism alone. However, the third of the Koch's Postulates, that pure cultures of the organism when injected into a suitable animal, must produce the disease, has never been proved. Recent workers stress the fact that these organisms are at all times present in healthymouths, and the disease results rather from local and systemic factors which produce environment ideal for the growth of the bacteria.

The factors producing Necrotic Ulcerative Gingivitis are listed by Miller as:

#### LOCAL

1. Erupting teeth
2. Poor oral sanitation
3. Irritating influences:
  - a. Excessive smoking
  - b. Calculus
  - c. Overhanging margins
  - d. Traumatic occlusion

#### SYSTEMIC

1. Physical exhaustion
2. Emotional tension
3. Nutritional deficiency
4. Any general metabolic disturbance lowering tissue resistance

One does not have to go very deep into the history of a patient on sick call to find these etiological factors.

#### ACCEPTED THERAPY:

Treatment as well as etiology is pretty well agreed upon in the dental profession. A conservative approach aimed at eliminating pain as soon as possible and slowing up or halting the destructive process of the disease in the acute stage is most popular. This usually consists of daily visits during the 4 to 7 days of the acute phase during which the pseudomembranous tissue and gross calculus depots are removed, and the tissue cleansed with 3% hydrogen peroxide, and irrigated with warm water. The crowns of the teeth are carefully polished with a porte polisher and pumice. A non-irritating spirocheticide or antibiotic may be applied although it is not imperative.

When the disease has progressed to a chronic stage further attempt is made to eliminate primary as well as secondary sites of involvement.

#### Primary Sites -- location of initial lesions:

1. Gingival flaps over partially erupted molars.
2. Lingual margins of interproximal gingivae of upper central incisors associated with deep gingival sulci or pre-existing periodontal pockets.
3. Buccogingival margins of molars in crowded contact with the mucous membrane of the cheek.
4. Cryptic tonsils.

Secondary Sites -- areas attacked after tissue resistance has been lowered sufficiently:

1. Gingival tissue of teeth in traumatic occlusion.
2. Gingival tissue with pre-existing inflammation due to calculus, overhanging fillings, gingival caries, and excessive smoking.
3. Periodontal pockets.

Needless to say the treatment lasts over a period of months but under this conservative regimen, as outlined by Merrit, Miller, Box and others, cure is assured.

Histological sections have proved that use of caustics, chromic acid and the like, in the treatment is as destructive to the tissue as the disease itself, and they should not be employed under any circumstances.

#### SUGGESTED THERAPY:

Several months of treating Army personnel living in temporary quarters and in the field have proved the impracticability of following the previously outlined conservative approach to treatment.

The literature at hand was thoroughly investigated with the thought in mind of finding a technique which would require less chair time, fewer dental appointments, and give relief and service, and send the patient back to duty as soon as possible. The strongest objection to thorough curettage and surgery on the initial visit seemed to be the fear of spreading the infection to a point over which the operator would have no control. On several patients under close observation thorough curettage and surgery were performed as early as the second visit to remove primary as well as secondary sites of involvement. The results were so gratifying that the therapy was extended to include men returning to duty in the field. The following is a general outline of the procedure:

#### 1st Visit:

1. Remove all pseudomembranous tissue.
  2. Remove all visible calculus and deposits in periodontal pockets.
  3. Thoroughly polish with cup and pumice all coronal areas including those covered by the free gingival margin.
  4. Thoroughly floss all interproximal areas.
  5. Intramuscular penicillin -- 300,000 units, IF:
    - a. Primary site is partially erupted 3d molar. (Continue until the tooth is extracted.)
    - b. Tissue involvement is extensive and fever is present.
- (NOTE: Not indicated where infection is localized to a small area.)
6. Give the following daily for approximately 10 days:
    - a. 500 mg of ascorbic acid
    - b. 10 mg of riboflavin



- Dismiss patient for 48 hours (quarters or light duty).

#### Home Care Recommended:

- Clean teeth with brush or cloth after each meal.
- Rinse mouth with warm water as often as possible.
- Use dental floss.
- Cut down on smoking.

#### Second Visit:

- Remove any remaining deposits from teeth and gums and polish teeth if necessary.
- Replace defective fillings.
- Irrigate with warm water.
- Dismiss patient for 24 hours.

#### Third Visit:

- Resect tissue in areas of greatest interproximal damage, chronic necrotic ulceration, and periodontal pockets. Cover these with surgical pack.
- Remove partially erupted 3d molars.
- Dismiss patient for 10 to 14 days after which time the pack is removed and the teeth polished. Replace pack for an additional 7 days if indicated.

#### SURGICAL PACK

<u>Powder</u>	<u>Parts by Volume</u>	<u>Liquid</u>		
Zinc Oxide	1	Eugenol	20	cc
Powdered Rosin	1	Oil Bitter		
Powdered Tannic Acid	1/4	Almond	10	cc
		Rosin	1.3	cc

#### RATIONALE OF THERAPY:

Pain usually accompanying necrotic gingivitis disappeared a few hours after the first visit. Clinical appearance of the tissue on the second visit was remarkably improved. None of the acute symptoms were present and pseudomembranous tissue was gone. Treatment was carried on with no more discomfort than a periodic prophylaxis. In many interproximal areas covered by pseudomembranous tissue at the first visit papillae are slightly inflamed but intact. In other areas where the pathognomonic signs of the disease have taken their toll, the tissue presents the appearance of chronic necrotic stomatitis. It is in these areas that gingival resection is suggested in order to remove the secondary sites of involvement and restore interproximal tissue.

The surgery employed is of the most conservative type. Only unattached tissue is removed and the remaining tissue is beveled to assure more rapid healing and better form. A small, straight scalpel and surgical scissors are used in this surgery.

In each instance, upon removing the surgical pack, interproximal tissue had reformed. It was intact and healthy, and consequently better able to resist future involvement.

ure involvement.

The importance of the surgical procedure is stressed as it has been found that these areas, unless kept constantly clean by the patient, become primary sites of future infection before the body can repair the damage done by previous attacks. Surgery hastens the healing process in these areas and the surgical packs protect them while tissue is being built and repaired.

#### COMPARATIVE RESULTS:

The results of the therapy suggested have been very gratifying. At this writing it is felt that it might be used in favor of more conservative methods. Certainly it is superior to the topical application of drugs during the acute phase of the disease. The procedure described has, for the most part, been suggested for use when circumstances are not favorable for the conservative approach.

#### SUMMARY:

Treatment procedures which are long, drawn-out affairs in civilian practice must often be modified and condensed to be effective under circumstances which frequently prevail in the Armed Forces.

In acute necrotic ulcerative gingivitis the modification should be directed toward elimination of the primary and secondary sites of involvement when circumstances are less than ideal.

Surgical removal of tissue affected by necrotic gingivitis has been suggested as means to this end.

To conserve time and give the best service primary and secondary sites of involvement must be eliminated as it has been said that Vincent's infection produces no immunity; in fact, a patient who has had the disease is apparently very susceptible to subsequent attacks. Adequate mouth hygiene, proper nutrition, correction of abnormal tooth, gum and mouth deformities are the best preventatives.

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# STATISTICAL ANALYSIS OF SECONDARY CLOSURES OF WAR WOUNDS

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In the SURGEON'S CIRCULAR LETTER, FEC, Vol. VI, No. 5, 1 May 1951, the principles of secondary closure of war wounds were discussed, and summarized as follows:

1. Thorough debridement prior to closure is essential.
2. Closure within the 4 to 6 day period is ideal, but the appearance of the wound rather than the length of time is the governing factor.
3. Wounds that require preparation for surgery should be treated by the wet pressure dressing method.
4. The principle of closure without tension is of

paramount importance. This may be accomplished by any one of several methods, but excision en masse is preferred.

5. Adequate drainage of most wounds is essential.
6. Gentle handling of tissues and the use of fine suture material are definite aids in wound healing.
7. Wounds of the face and back require special consideration.

This paper will analyze the results of 100 consecutive wounds closed by the author in accordance with these principles, and likewise present a comparison with 124 consecutive wounds closed by other surgeons supervised by the author. The two groups will be presented as Series A - those done by the author; and Series B - those done by 9 other surgeons, three of whom were classified as C-3150; four as D-3150; two as 3100. (Of the four D-3150's, one was unquestionably of "C" caliber.)

## NUMBER AND LOCATION OF WOUNDS

### Series A

### Series B

#### CHART 1

#### CHART 1

Patients	74
Wounds	100
Upper Extremity	14 - 14%
Lower Extremity	61 - 61%
Other parts of body	25 - 25%

Patients	102
Wounds	124
Upper Extremity	23 - 19%
Lower Extremity	61 - 61%
Other parts of body	25 - 20%

Note that the above chart is not a picture of the breakdown of all war wounds into various parts of the body, but those that lent themselves to secondary closure.

## LOCATION OF WOUNDS OTHER THAN EXTREMITIES

### Series A

### Series B

#### CHART 2

#### CHART 2

Buttocks	10
Sacral and lumbar region	5
Anterior chest wall	1
Posterior chest wall	0
Anterior shoulder	0
Posterior shoulder	0
Face	2
Scalp	2
Posterior neck	5
TOTAL	25 - 25%

Buttocks	10
Sacral and lumbar region	4
Anterior chest wall	4
Posterior chest wall	1
Anterior shoulder	4
Posterior shoulder	2
Face	0
Scalp	0
Posterior neck	0
TOTAL	25 - 20%

## SITE OF LOWER EXTREMITY WOUNDS

### Series A

### Series B

#### CHART 3

#### CHART 3

Thigh	25
Leg	32
Foot	3
Popliteal space	1
Knee	0
TOTAL	61 - 61%

Thigh	33
Leg	34
Foot	2
Popliteal space	2
Knee	5
TOTAL	76 - 61%

Acknowledgment is made to Captain Hannah T. Browne, ANC, Osaka Army Hospital, for the invaluable assistance she rendered in the compilation of statistics.



An analysis of chart 3 shows that lower extremity wounds are fairly equally divided between the thigh and the leg. An important consideration in lower extremities wounds is that usually thigh wounds can be closed by mobilization of wide flaps; whereas in the leg, the mobility of flaps is limited, and it is ordinarily the course of good surgical judgment to use split grafts. Thigh wounds have a tendency to gape and give the false appearance of a large amount of skin loss. A decision to graft thigh wounds, therefore, should not be made until dissection at the operating table has proven the impracticability of flap mobilization.

#### SITE OF UPPER EXTREMITY WOUNDS

Series A		Series B	
<u>CHART 4</u>		<u>CHART 4</u>	
Arm	5	Arm	8
Forearm	4	Forearm	10
Hand	5	Hand	5
Elbow	0	Elbow	1
TOTAL	14 - 14%	TOTAL	23 - 19%

Note the comparatively small number of upper extremity wounds, particularly those of the hand. Many more hand wounds passed through the installation, but for the most part they were long term reconstructive problems that were evacuated to the ZI for definitive therapy. Wherever possible, secondary closure or grafting was performed in order to convert an open wound into a closed one, prior to evacuating the patient. The hand should always be considered in terms of a functional whole unit, rather than in terms of a localized lesion. Immobilization may be sacrificed for function. By the same token, hand injuries may, when practical, be primarily closed at forward installations in order to preserve vital structures. By the use of good surgical judgment and the administration of full dosages of antibiotics, a goodly percentage of successful primary closures should result.

#### SIZE OF WOUNDS

Series A		Series B	
<u>CHART 5</u>		<u>CHART 5</u>	
Smallest wound	3 cm (circular-over tibia)	Smallest wound	3 X 1 cm
Largest wound	875 sq. cm (25X35 cm-thigh)	Largest wound	375 sq. cm (25X15)
50 sq. cm or less	82%	50 sq. cm or less	102 - 82%
51 - 100 sq. cm	8%	51 - 100 sq. cm	11 - 9%
101 - 300 sq. cm	8%	101 - 300 sq. cm	9 - 7%
over 300 sq. cm	2%	over 300 sq. cm	2 - 2%
TOTAL	100%	TOTAL	124 - 100%

#### LENGTH OF TIME FROM WOUNDING TO ARRIVAL IN HOSPITAL IN JAPAN

Series A			Series B		
<u>CHART 6</u>			<u>CHART 6</u>		
1 - 3 days (0 thru 72 hours)	No. 58	% 58%	1 - 3 days (0 thru 72 hours)	No. 39	% 31%
4 - 6 days (73 thru 144 hours)	32	32%	4 - 6 days (73 thru 144 hours)	51	41%
One week or over	10	10%	One week or over	34	28%

#### DEBRIDEMENT STATUS ON ARRIVAL IN HOSPITAL IN JAPAN

Series A			Series B		
<u>CHART 7</u>			<u>CHART 7</u>		
Debrided	No. 25	% 25%	Debrided	No. 98	% 80%
Not debrided	75	75%	Not debrided	26	20%



# LENGTH OF TIME FOR PREPARATION OF WOUNDS

Series A

Series B

CHART 8

CHART 8

Shortest time	1 day
Longest time	37 days (ulcer over tibia)
1 - 5 days	40%
5 - 10 days	40%
Over 10 days	20%

Shortest time	1 day
Longest time	23 days (FCC Forearm)
1 - 5 days	37%
5 - 10 days	37%
Over 10 days	26%

Considering Charts 6, 7 and 8 as a unit, certain interesting facts come to light. Note the reversal in percentages of debridements in Chart 7 between Series A and B. This is due to the fact that approximately 30% of the cases in Series A were patients flown from Korea during the November Communist push, including the Hamhung and Hungnam evacuations. Tactical conditions did not permit debridements in Korea during that period. However, the percentage of wounds that could be closed in the ideal period of 4 - 6 days after wounding does not vary appreciably between the two series. One would expect that a greater percentage of series B wounds could have been closed earlier than series A, since 80% of the former had been debrided. One explanation is that while 80% of the wounds of series B had been debrided, the debridement was not adequate, so that wet dressing preparation of the wounds was still necessary prior to closure. A second factor is that twice as many series A cases arrived in Japan within the first 72 hours after wounding, as compared to series B. This permitted wound preparation to be initiated earlier in series A than in series B, thus allowing earlier closure in the former. It can be concluded from Chart 8 that 75 - 80% of wounds can be prepared for closure within 10 days after wounding. The remaining 20 - 25% are the problem cases that will tax the ingenuity of the surgeon, and require such procedures as repeated antibiotic sensitivity studies; more adequate debridement and removal of foreign bodies; and a complete review of the patient's physiologic state to determine any generalized cause for poor wound healing.

## SUTURE MATERIAL USED

Series A

Series B

CHART 9

CHART 9

000 Black Silk	60%
00 Black Silk	0%
000 Black Silk plus Buried Suture	25%
No. 80 cotton	60%
No. 120 cotton	40%
Catgut	0%
.009 Steel	8%
.009 Steel plus 000 Black Silk	4%
Others	3%

000 Black Silk	44 - 35.5%
00 Black Silk	17 - 14 %
000 Black Silk plus Buried Suture	45 - 38 %
No. 80 cotton	37
No. 120 cotton	2
Catgut	6
.009 Steel	4 - 3 %
.009 Steel plus 000 Black Silk	11 - 9 %
Others	3 - 2.5%

An analysis of Chart 9 reveals that heavy suture material is unnecessary in secondary closure of war wounds. 85% of wounds in series A and 71% of wounds in series B were closed with 3-0 black silk with or without buried suture no larger than No. 80 cotton. The 17% of wounds in series B closed with 2-0 black silk could easily have been closed with 3-0 black silk. It was necessary to indoctrinate surgeons newly arrived at this installation with the basic principle of usage of fine suture material.

## TYPES OF CLOSURES

Series A

Series B

CHART 10

CHART 10

Straight Closure (includes one Z-plasty)	74%
Split Graft	17%
Graft and Closure (includes 3 local flap shifts)	9%

Straight Closure	112 - 90%
Split Graft	12 - 10%
Graft and Closure	0 - 0%

## RESULTS

Series A

Series B

CHART 11

CHART 11

Requiring No Further(Healing per Primam	74	74%
Surgery		
(Slight Infection at		
Suture Line with no	10	10%
Tissue Loss		
Loss of Tissue		
(10% or Less	6	6%
TOTAL	90	90%

Requiring No Further(Healing Per Primam	78	63%
Surgery		
(Slight Infection at		
Suture Line with no	13	10%
Tissue Loss		
Loss of Tissue		
(10% or Less	6	5%
TOTAL	97	78%



(RESULTS - Chart 11 - Cont'd)

Requiring Further Surgery	(Loss of Tissue 10 - 40%)	6	6%	Requiring Further Surgery	(Loss of Tissue 10 - 40%)	15	12%
	(Loss of Tissue 50%)	3	3%		(Loss of Tissue 50%)	1	1%
	(Complete Breakdown)	1	1%		(Complete Breakdown)	11	9%
TOTAL		10	10%	TOTAL		27	22%

Note that in series A, 90% of the cases healed either per primam or had insignificant loss of tissue so that no further surgery was required. This result compares favorably with the statistics compiled in World War II. The 78% result in series B does not compare favorably with this criterion. It is to be remembered that nine surgeons, two of whom did not have a surgical MOS, comprised the operators in series B. Of these nine, four had no previous experience with war wounds. The difference in results in the two series is statistically significant. It is believed that this difference is largely due to the variation in technique and clinical experience between the operators in the two series. At first glance, this line of reasoning appears to be strengthened by the figures in Chart 12. The total results, however, 78% vs. 85% are not statistically significant. Contrariwise, the healing in the per primam group in this chart falls short by less than 1% of being statistically significant and hence does tend to bear out the findings in Chart 11.

RESULTS OF SURGEON OF VARYING ABILITIES IN SERIES "B"

CHART 12

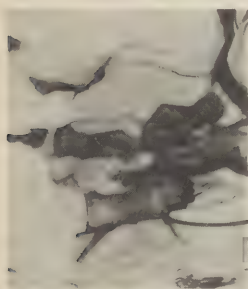
Surgeon "1" C-3150			Surgeon "2" D-3150*		
	No.	%		No.	%
Healing per primam	21	42		35	66
Slight Infection	10	20		6	11
Loss of 10% or less	8	16		4	8
TOTAL	39	78%		45	85%
Loss of 10 - 40%	6	12		6	11
Loss of 50%	0	-		1	2
Complete breakdown	5	10		1	2
TOTAL NUMBER WOUNDS	50	100%		53	100%

(\* This "D" Surgeon is of "C" caliber.)

CONCLUSION:

A series of 224 consecutive war wounds that were secondarily closed at the 8th Station Hospital and Osaka Army Hospital was statistically analyzed. The total number of cases reported is small as compared to the thousands of closures that were analyzed in World War II. It is believed, however, that this is the first series reported from the Korean conflict, and while admittedly small, was carefully and meticulously recorded. The following conclusions, none of which are new, are re-emphasized from the foregoing charts.

1. Early adequate debridement will permit early successful closure.
2. 75% - 80% of wounds may be closed within 10 days after occurrence.
3. Heavy suture material is neither necessary nor desirable for successful secondary closures.
4. Technique and clinical experience on the part of different surgeons will account for significant differences in results of secondary closures.



THE SURGERY OF MITRAL STENOSIS\*  
Laurence B. Ellis, M.D.

Physicians caring for patients with mitral stenosis of rheumatic origin now face a dilemma which is new to them. Formerly they had no alternative but to treat these patients by the appropriate symptomatic medical means. Now they have the choice between such therapy

and the recommendation of surgery designed to break down the mechanical barrier which is the fundamental

pathological disturbance. Physicians must therefore know whether such surgery offers the chance of worthwhile improvement without a prohibitive operative

\*This article is an abridgement of a paper by Harken, D.E., Ellis, L.B., Dexter, L., Farrand, R.E., and Dickson, J.F. entitled "The Responsibility of the Physician in the Selection of Patients with Mitral Stenosis for Surgical Treatment" to be published in CIRCULATION. The reader is referred to this paper for elaboration of details and for references.



mortality, and if so, at what stage in the clinical course of the disease operation should be recommended. To know this they must understand what the life cycle of patients with mitral stenosis under medical management is. It is the purpose of this article to answer, in a preliminary fashion, some of these questions.

#### MORPHOLOGICAL CLASSIFICATION OF MITRAL STENOSIS:

There are two basic patterns of mitral stenosis. Type I is primarily a rigid, fibrous contraction of the leaflets to a stenotic opening with little thickening or fusion of the chordae tendineae. More than 85% of patients are dominantly of this type. Type II consists of an elastic funnel with marked fusion of the chordae tendineae. These fused chordae may even constitute secondary stenosis. Calcification is common in Type I, rare in Type II. There is a whole spectrum of variations from Type I to II. Furthermore, either of these types can have a valve orifice of a given size and yet may or may not have an associated regurgitation. If the mouth of the funnel is turned toward the myocardium, the ventricular wall may close the orifice in systole and prevent regurgitation. This is called Group A. If the stenotic orifice, rigidly held open by the pathologic process, faces out into the left ventricular outflow tract, there may be extensive regurgitation (Group B). Type I responds well to valvuloplasty; Type II less well.

#### PRESENT VALVULOPLASTY AND ITS DEFICIENCIES:

The technique of finger-fracture valvuloplasty, which has been described in detail elsewhere, consists of blunt dissection of the fusion bridges with the finger, and is possible in the vast majority of patients. In some of the Type II forms of the disease (approximately 10% of all patients), it is necessary to use instruments for incision somewhat similar to Bailey's valvulotome.

The finger-fracture valvuloplasty technique is preferred to valvulotomy or commissurotomy for four reasons: First, delicate digital exploration of the stenotic orifice and of the leaflets is difficult when encumbered by an instrument. Second, incision through large calcific vegetations is both difficult and dangerous because of the possibility of dislodging emboli from the vegetations or because of thrombosis incident to crushing. Conversely, blunt finger dissection around such vegetations is simpler and safer. Third, hook knives pick up chordae tendineae on the under side of the leaflets and more regurgitation may be produced. Therefore, when the necessity for incision arises a valvulotome that combines a cutting edge with finger-fracture is to be preferred. Fourth, the hazards of insertion of the finger into the auricle are increased in the presence of thrombosed and contracted auricular appendages or of laminated intra-auricular clots. Such hazards are greatly augmented by the addition of an encumbering instrument on the finger, particularly if it is necessary to enter the heart through the superior pulmonary vein. These unfavorable situations tend to occur more frequently in the sicker and older patients.

Although at times the result of finger-fracture valvuloplasty feels to the surgeon like a nearly perfect restoration, a consideration of the closing mechanism of the normal leaflets with that of a diseased and stenotic orifice, indicates that the closing mechanism which has been produced is quite different from that which exists in health. The normal leaflets close like parachutes which have been placed in juxtaposition. The closure is secured by a broad surface of leaflet contact and overlap. The papillary muscles

and chordae tendineae anchor the margins, then tighten the closure. Valvuloplasty in advanced disease brings about a simple flutter-valve mechanism. This simpler valve is generally competent and adequate for normal intraventricular pressures, but is less likely to withstand high intraventricular pressures such as occur with aortic stenosis or insufficiency, or hypertensive disease. When the chordae are markedly shortened and thickened it is particularly difficult to produce a good flutter-valve and it may be necessary to compromise by producing selective insufficiency through an incision or fracture of the ventricular leaflet. Unfortunately, there is no method at the present time of differentiating the types of stenosis before operation. Type II occurs, however, in less than 15% of patients, and less than 5% of valves cannot be significantly improved by current surgical approaches.

The place for prosthetic devices and similar techniques in the surgery of mitral stenosis and insufficiency has not yet been defined although several interesting possibilities are being explored.

The problems of anesthesia are very great in some patients with high pulmonary vascular pressures and in those with liver and myocardial damage. The muscular relaxation and peripheral vasodilatation produced by anesthesia present grave problems in the patient with a small, fixed cardiac output. Various methods of avoiding or counteracting this hypotension are under investigation. Drugs such as neosynephrine, mechanical adjuncts, and intra-arterial transfusion may be helpful.

The problem of preventing or dealing with pulmonary edema is inextricably linked up with the problem of avoiding tachycardia. The danger of tachycardia in contributing to pulmonary edema has been stressed by us elsewhere. In the operating room the use of intravenous prostigmine in doses of 0.25 mgm. has at times been effective in reducing rapid heart rates of various types, although it is too early to state whether there are also serious concomitant disadvantages to its use. The control of ventricular irritability and the prevention of ventricular fibrillation by the judicious but not excessive use of procaine, procaine amide, and similar drugs are improving.

The danger of embolic phenomena remains great, and occurs especially in patients with auricular fibrillation, in those with chronic congestive failure, when recent rheumatic activity has occurred, and in the older age group. Advances in surgical technique at operation, and the judicious use of heparin post-operatively have reduced, but not eliminated, this hazard.

#### THE LIFE CYCLE OF PATIENTS WITH MITRAL STENOSIS:

It is well known that patients with mitral stenosis have a clear-cut history of a previous rheumatic infection in only about one-half of the cases. Looking at it from a somewhat different point of view, if patients are followed from the time of their first recognizable active rheumatic carditis, it has been shown to take at least 5 to 15 years before fully developed clinical signs of mitral stenosis are present. It is not known what circumstances determine the evolution of the stenosing process; whether it is the repeated insults of a continuing active rheumatic process, or whether it is due chiefly to the contraction of the scarred valve margins, or both. This of course has a bearing on the surgical results of operated cases. Because of this time duration in the development of mitral stenosis, comparatively few



patients in the first two or even the first half of the third decade of life present themselves with clear indications for surgical intervention. Furthermore, the possibility of serious active carditis is greatest in this younger age group.

Although many patients with mitral stenosis run a comparatively benign course and live into the sixth, seventh, and eighth decades, nevertheless, most patients ultimately die from the effects of their disease. In a study reported elsewhere by one of us, it was found that heart failure of one type or another accounted for 44% of the deaths; in an additional 33% acute events in the peripheral circulation, mainly embolic, produced death. Pulmonary infarctions accounted for 11%. It can be seen, therefore, that the circulatory breakdown in patients with mitral stenosis occurs in differing fashions. In a good many patients the valvular obstruction apparently does not interfere significantly with effective circulation, and this may be true even in the presence of a fairly high degree of stenosis. Such patients run a course into the later age groups and die of congestive failure or peripheral vascular accidents, and many of these have associated hypertension or degenerative vascular disease.

In another and younger group, active rheumatic infection dominates the picture. In our series of pathological cases studied at postmortem, active rheumatic infection was found to be a significant factor in determining death in only one of 100 patients. Many patients develop and still die of the consequences of bacterial endocarditis -- 8% in our series. There is a final group, and this is the group with which we are particularly concerned in the surgery of mitral stenosis. These are patients who usually have increasing pulmonary difficulty that can be explained largely on a mechanical basis due to the elevated pressure in the pulmonary capillaries leading to edema. This disability may be chronic dyspnea or it may be punctuated by acute attacks of violent dyspnea or pulmonary edema, hemoptysis, cough, wheezing; there is frequently a sense of fatigue and a tendency to lose weight. The deterioration of these patients may be steady and slow, but it frequently increases rapidly. Although slight edema may be present and many patients get relief of dyspnea from sodium depleting regimens, true right-sided failure has not yet developed. The possibility of peripheral emboli occurring at any time is very real, especially in those who are in auricular fibrillation. Their disability is severe and increasing, the prognosis under medical management is hazardous, and since their symptoms stem back directly to the obstruction of the mitral valve, the prospect of relief by surgery in these cases is excellent.

The final phase in this group is when the right ventricle fails, massive edema occurs with chronically enlarged livers, and the venous pressures are elevated. Pulmonary symptoms may or may not be somewhat alleviated at this point. Pulmonary infarctions are common. Most of the patients are in auricular fibrillation. Functional tricuspid insufficiency may develop. These patients are chronic invalids. Since the disease has progressed so far, the prospect of significant improvement by operation is not as good as in the former group; the risk of operation is very much greater.

There is, unfortunately, no simple way of selecting patients who are suitable candidates for operation other than by a complete evaluation of the clinical picture. Objective studies such as by cardiac catheterization are helpful and in obscure cases occasionally essential.

Although organic changes in the pulmonary circulation, may occur in patients with mitral stenosis and may be severe, the fear that such changes may prevent significant improvement following operation has not been borne out by the empirical results and the postoperative objective studies. Either such organic changes regress or they do not act as a barrier to an efficiently functioning circulation.

#### CLINICAL CLASSIFICATION OF PATIENTS WITH MITRAL STENOSIS:

A working classification which has been found useful in the light of our present knowledge is as follows:

Group I: comprises patients whose present course is BENIGN. They have auscultatory signs of mitral stenosis but few, if any, symptoms and minimal evidence of increase in pulmonary vascular pressure. Patients in this group may continue to run benign course or they may develop an acceleration of their illness which shifts them to one of the other groups.

Group II: includes patients somewhat HANDICAPPED by a static degree of moderate dyspnea on effort or by rare attacks of acute dyspnea or other pulmonary symptoms provoked by an extrinsic cause such as unusual exertion, fatigue or by severe infection. Rarely they may have some peripheral edema but they do not have evidence of frank right ventricular failure.

Group III: includes patients whose disability is progressive rather than static. There may be increasing dyspnea on effort or easily provoked attacks of hemoptysis, chest pain or pulmonary edema. They may suffer from palpitation, tachycardia and distress over the liver on exertion. At any time they may slip into Group IV or may die in an acute attack of pulmonary edema or from peripheral or pulmonary infarction. Their life expectancy under medical therapy is HAZARDOUS.

Group IV: is a TERMINAL group. They are completely incapacitated, usually with right ventricular failure manifested by chronically elevated venous pressure, considerably enlarged liver, and a marked tendency to congestion. Their pulmonary disability may or may not be greater than those in Group III. They often have poor liver function, ascites, evidence of decreased peripheral blood flow, and many have had emboli. Most of them are in auricular fibrillation.

Certain additional factors of importance in evaluating patients for operation are not included in this classification. These factors may affect the operative risk or the results to be expected from surgery, and hence they may constitute relative or absolute contraindications.

1. Clinically obvious ACTIVE RHEUMATIC INFECTION is a contraindication. In the presence of active carditis the degree of eventual residual clinical handicap is difficult to assess, and the surgical risk and results in these cases have not been clarified.

2. AORTIC VALVULAR DISEASE, sufficient to produce definite enlargement of the left ventricle or clear-cut peripheral signs of aortic regurgitation, is a contraindication. The presence of a blowing diastolic murmur of not more than Grade II intensity along the left sternal border, which may be due either to mild aortic regurgitation or to functional pulmonic regurgitation, by itself does not contraindicate operation.



3. MITRAL REGURGITATION is a relative contraindication. This is difficult to quantitate. The intensity of the apical systolic murmur is not a good guide unless it is very loud or musical. The presence of enlargement of the left ventricle in the absence of aortic valve disease suggests its presence, but slight enlargement of this chamber is not easy to determine when marked enlargement of the right ventricle exists. Marked pulsation of the left auricle, or very marked dilatation, suggests such a diagnosis but these are not infallible signs. The pulmonary "capillary insufficiency" curves obtained by cardiac catheterization may be of help but are not often readily available.

4. AURICULAR FIBRILLATION or a history of definite PERIPHERAL EMBOLI does not contraindicate operation but increases the risk somewhat because of the possibility of dislodging thrombi in the auricle.

5. ADVANCED AGE obviously increases the risk and the possibility that irreversible changes have occurred. Patients over 50 should be scrutinized carefully before deciding on operation.

6. TRICUSPID STENOSIS militates against favorable results. Catheterization may be necessary to distinguish between organic stenosis and functional regurgitation.

7. ASSOCIATED DISEASE within the circulation, the lungs, or elsewhere must be evaluated.

THE PRESENT STATUS OF SURGERY (as of June 1, 1951): Group I patients are not disabled by their disease and do not need surgery. None have been operated in this group.

In Group II patients, operation should usually be deferred since it is reasonable to expect that operative techniques and risk will improve. On occasion, however, operation may be justified in patients who are unable or unwilling to accept longer their present degree of disability. The results should be ex-

cellent and the risk low (on the basis of experience with Group III patients in this clinic). Up to the present time, however, no patients in this Group have been operated upon by us.

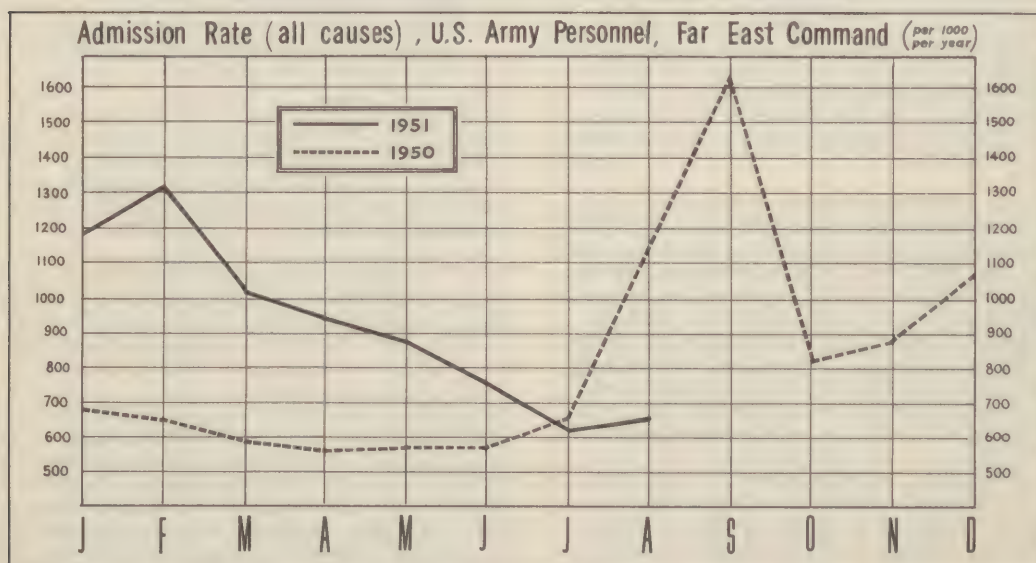
Group III patients constitute the ideal group for operation. Their life expectancy without operation is hazardous, and the chances of improvement - often very marked - with operation are excellent. The operative mortality at the present time in our series is less than 10% (4 out of 48 cases). All who have survived operation are alive and improved. Most of them are leading useful lives. The improvement has been maintained or increased in all patients for as long as they have been followed (up to 3 years in some cases).

Group IV, like Group II is a borderline group, but in a different way. These patients are desperately sick. This is illustrated by an inadvertently created control group of patients of this type who were acceptable for surgery but who did not have it for various reasons. There were 19 of these patients; 17 were dead within one year, 15 within 6 months. Thus the surgical results and the operative mortality of this group must be assessed in the light of the type of patient with whom we are dealing. The operative mortality is high; 14 out of 39 patients. The degree of improvement is less striking than in Group III, but the majority have had worthwhile improvement and in some it has been dramatic.

#### SUMMARY:

This communication has dealt with the problem of the surgery of mitral stenosis. An anatomical description has been given of the types of mitral valve disease which may be encountered. The present technique of mitral valvuloplasty with its deficiencies and attendant problems has been described. The life cycle of patients with mitral stenosis has been set forth, leading up to a classification of the disease into four groups useful in the selection of patients for operation. The operative mortality and results in these groups have been given.

## HEALTH OF ARMY TROOPS, FEC



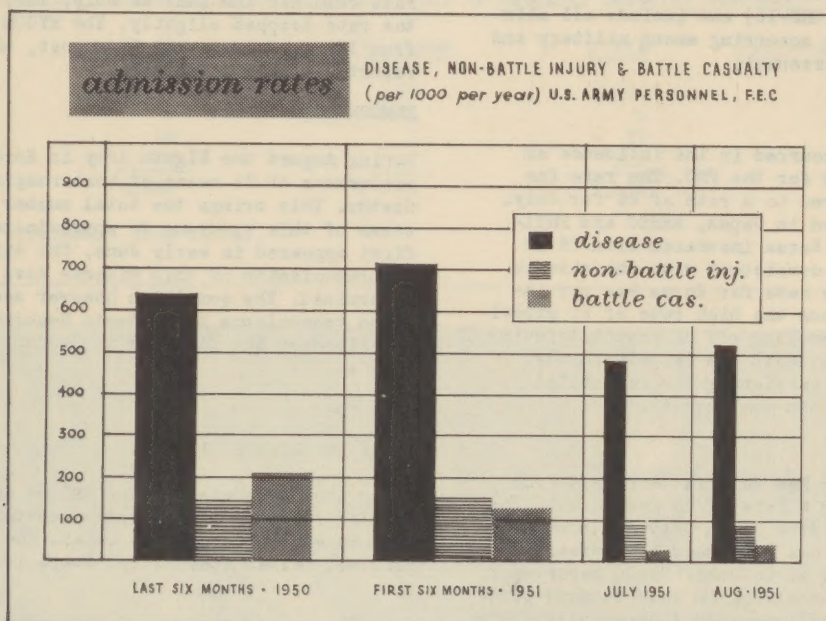


Admission rates per 1,000 troops per annum, Army personnel, for the 5-week period ending 29 August 1951 were as follows:

	FEC	JAPAN	KOREA	MARBO	PHILCOM(AF)	RYCOM
All Causes	658	501	749	348	309	524
Diseases	519	435	570	254	280	456
Injuries	95	66	111	94	29	68
Battle Casualties	43	0	68	0	0	0
Psychiatric	25	15	32	4.7	7.4	13
Common Respiratory Diseases and Flu	53	63	47	47	125	51
Primary Atypical Pneumonia	2.0	2.4	1.9	0	7.4	0
Bacillary Dysentery	2.1	.55	3.0	0	7.4	0
Amebiasis	.53	.28	.69	0	0	0
Malaria, new	18	27	15	9.4	7.4	3.4
Infectious Hepatitis	12	6.2	15	4.7	0	9.2
Dermatophytosis	5.7	5.9	5.6	9.4	7.4	6.7
Rheumatic Fever	.47	1.1	.18	0	0	0
Venereal Diseases	177	160	189	24	29	159

#### DAILY NON-EFFECTIVE RATE

	23	46	11	11	50	15
All Causes						



#### ALL CAUSES ADMISSION RATE:

In August, Army personnel of the FEC were admitted to medical treatment facilities and quarters for all causes at a rate of 658 per 1,000 strength per year. This is a slight increase from the July rate of 616. Minor increases were reflected in Japan, Korea and MARBO. PHILCOM (AF) and RYCOM reported decreases. The all causes admission rate for August 1950 was 1,163.

The disease component of the all causes admission rate increased from 489 in July to 519 in August. Increases in the disease rates for Japan and Korea were not significant. MARBO reported a more substantial increase while PHILCOM (AF) and RYCOM reported decreases. During August, the principal contributors to the all causes rate were diseases falling into the category of undiagnosed and chronic conditions. Decreases were reflected in common respiratory diseases and influenza, dysentery, malaria and venereal diseases.

No change occurred in the nonbattle injury rate for August. The rate remained 95. Minor increases in Japan and MARBO were offset by decreases in Korea, PHILCOM (AF) and RYCOM. The nonbattle injury rate for Korea has shown a steady decrease since January.

Battle casualty admission rates for the FEC increased to 43 in August. The rate for July was 32. The Korea rate for August is 68 as compared to 50 for the previous month.

#### DAILY NON-EFFECTIVE RATE:

The daily non-effective rate for the FEC decreased from a rate of 25 in July to 23 in August. The Korea and RYCOM rates remained the same. The rate in Japan was 46 in August as compared to 56 for July. Since March the non-effective rate for PHILCOM (AF) has remained static as a result of the inactivity in the discharge of Philippine Scout patients.



## DISEASES:

### DISEASES OF THE CENTRAL NERVOUS SYSTEM:

In August, there were 18 new cases of poliomyelitis reported in the FEC. This brings the total of reported cases to 54 for the first 8 months of 1951. Last year for the same period there were 56 cases. Of the 18 new cases, 10 occurred in Japan, 7 in Korea and 1 case in RYCOM. One Japan case in Navy personnel and 1 Korea case in Army personnel resulted in death.

There were 9 cases of clinically diagnosed encephalitis reported in August, bringing the total number to 53 cases reported in 1951. Four cases originated in Korea and 5 from RYCOM. Three cases among Air Force personnel reported from RYCOM have now been confirmed as Japanese "B" type encephalitis.

Six new cases of meningitis of various types occurred in August, making a total of 30 cases for 1951. Three cases were reported from Japan and 3 cases from Korea. The above data on diseases of the central nervous system are obtained from Special Telegraphic Reports of Epidemic Diseases (MED-16) and include all clinically diagnosed cases occurring among military and civilian occupation personnel.

### PSYCHIATRIC:

Only slight changes occurred in the incidence of psychiatric conditions for the FEC. The rate for August is 25 as compared to a rate of 24 for July. Decreases were reported in Japan, MARBO and PHILCOM (AF). The rate in Korea increased from 28 in July to 32 in August, consistent with the rise in battle casualties. The rate for Korea has not increased materially since the high rate of 56 experienced in June. This leveling off of psychiatric incidence in Korea is no doubt due largely to the stabilized system of reassigning the reprofiled hospital returnees to non-combat duty.

### MALARIA:

The admission rate for new malaria decreased from the July rate of 23 to a rate of 18 for August. The rate in Korea dropped from 18 in July to 15 for this month. The Japan rate has continued to decrease since the high rate of 42 in June. MARBO reported 2 new cases, the first occurring in this command since April 1950. PHILCOM (AF) reported 1 case while RYCOM reported 4 new cases.

### DYSENTERY:

There were no cases of dysentery reported by MARBO and RYCOM in August. Slight increases were reported from Japan and PHILCOM (AF). The overall rate for the FEC dropped from 12 to 7.1. Since the majority of the intestinal diseases infections occur in Korea,

### HOSPITALIZATION:

The bed status as of 29 August 1951 was as follows: (These data cover all patients, Army, Air Force and others.)

	<u>Designated Beds</u>	<u>Operating Beds</u>	<u>Average Beds Occupied</u>	<u>All Patients</u>	<u>Army Hospitals</u>	<u>Army Patients</u>	<u>USAF Hospitals</u>
JAPAN	8,250*	10,250	5,440			198	
KOREA	4,700	4,897	2,075			6	
MARBO	200	390	56			-	
PHILCOM (AF)	100	116	66			13	
RYCOM	400	388	270			-	
FEC	13,650	16,041	7,907			217	

the lower rate for the FEC is attributable to the lessened rate from 18 to 10 reported from Korea for August. Bacterial food poisoning cases totaled 152 for August. 71 cases occurred in Japan and 81 in Korea. The lower rate for dysentery reported in August is significant since the incidence of these infections may frequently be expected to increase at this time of the year.

### INFECTIOUS HEPATITIS:

Slight increases in the rates for infectious hepatitis were reported in August. This increase is due wholly to the increased number of cases in Korea. The rate for Japan and RYCOM remained static. PHILCOM (AF) reports no cases and the rate for MARBO decreased in August. The overall rates for this disease continued to drop since the high rate of 26 in April. The August rate for the FEC is 12.

### VENEREAL DISEASES:

The venereal disease rate for the FEC decreased in August to 177. The rate for July was 181. The Korea rate remained the same as July, 189, and in Japan, the rate dropped slightly. The RYCOM rate decreased from 179 in July to 159 in August, while PHILCOM (AF) reported a slight increase.

### HEMORRHAGIC FEVER:

During August the Eighth Army in Korea reported the occurrence of 25 cases of hemorrhagic fever with 4 deaths. This brings the total number of reported cases of this syndrome to approximately 100 since it first appeared in early June. The etiology and mode of transmission of this disease have not yet been determined. The condition however seems to bear a close resemblance to Epidemic Hemorrhagic Fever first described by the Japanese in Manchuria in the late 1930's.

### OTHER REPORTABLE DISEASES:

Among Army personnel in the FEC no cases of smallpox, scarlet fever or typhus were reported. One case of typhoid was reported from Japan. The incidence of measles, German measles and mumps is negligible.

### DEATHS:

During the five week period covered in the August report, a total of 76 deaths was reported by all medical treatment facilities in the FEC. Of the total, 18 deaths were due to disease, 25 to nonbattle injuries and 33 to battle casualties. Ten deaths occurred in Japan, 65 in Korea and 1 death due to nonbattle injury occurred in MARBO.



In Korea, there were 12,000 POW operating beds, 8,658 of which were occupied.

(\*Does not include 2,000 TD beds.)

The percent of designated beds and operating beds in Army hospitals occupied as of 29 August 1951 was as follows:

	<u>Percent of Designated Beds Occupied</u>	<u>Percent of Operating Beds Occupied</u>
JAPAN	53*	53
KOREA	44	42
MARBO	28	14
PHILCOM (AF)	66	57
RYCOM	68	70
FEC	51*	49

(\*Percentage based on designated beds plus 2,000 TD beds.)

#### EVACUATION:

Tabulated below is the number of patients (all types of personnel) evacuated from the major commands to the ZI during the five report weeks in August and the number of patients awaiting evacuation as of 31 August 1951:

	<u>By Air</u>	<u>By Water</u>	<u>TOTAL</u>	<u>Patients Awaiting Evacuation</u>
JAPAN	1,319	45	1,364*	61
MARBO	2	1	3	1
PHILCOM (AF)	16	1	17	2
RYCOM	96	24	120	20
FEC	1,433	71	1,504	84

(\*1,279 patients originated from Korea.)



An Infantryman of 21st Inf. Regt., wounded on Hill 851, is given Plasma in Bn Aid Sta. Army Chaplain assists.





The Chief Surgeon extends an invitation to all Far East Command medical personnel of the U. S. Army, Navy and Air Force, or of the United Nations, to prepare and forward with view to publication, articles of professional or administrative nature. It is assumed that editorial privilege is granted unless author states otherwise.

Lt. John J. Griffin, Editor